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CONTRIBUTIONS FROM THE GRAY HERBARIUM OF HARVARD UNIVERSITY—No. CLXX

THE AMERICAN BARBISTYLED SPECIES OF TEPHROSIA (LEGUMINOSAE)

CARROLL E. WOOD, JR.

(Continued from page 302)

18. **Tephrosia florida** (F. G. Dietr.) comb. nov.

Galega villosa Michx. Fl. Bor. Amer. **2:** 67. 1803, not. L. 1753. Carolina to Florida. (GH-photograph of Type in Herb. Mus. Paris.)

Tephrosia villosa (Michx.) Pers. Syn. Pl. **2:** 329. 1807, not (L.) Pers. 1807.

Galega florida F. G. Dietr. Vollst. Lexik. Gaertn. Nachtr. **3:** 422. 1817. Carolina and Florida. Based on *Galega villosa* Michx. See discussion below.

Galega ambigua M. A. Curtis, Bost. Jour. Nat. Hist. **1:** 121. 1835. "Sandy woods," (near Wilmington, North Carolina). (NY-specimen labeled "*Galega ambigua*, mihi; G. hispidula, P[urs]h. Ell[iott]. non M[ichau]x., N. Carolin, Curtis."-Type)

Tephrosia ambigua (M. A. Curtis) Chapm. Fl. Southern U. S. 96. 1865.

Cracca ambigua (M. A. Curtis) Kuntze, Rev. Gen. **1:** 174. 1891, basonym wrongly attributed to Chapm.

Tephrosia ambigua var. *gracillima* B. L. Robinson, Bot. Gaz. **28:** 201. 1899. "Dry pine barrens near Eau Gallie, Indian River [Brevard County], Florida," *A. H. Curtiss 584*, July, *5708*, 16 July 1896 (GH-Cotypes; *584*-MO, NY, US; *5708*-FLAS, KSA, MO, NY, POM, UC, US).

Cracca gracillima (Robinson) Heller, Cat. N. Amer. Pl. ed. 2. 7. 1900.

Tephrosia gracillima (Robinson) Killip, Jour. Wash. Acad. Sci. **26:** 360. 1936.

Cracca angustissima (Shuttlew.) Kuntze, sensu Vail, Bull. Torr. Cl. **22:** 32. 1895.

Prostrate to erect herbaceous perennial from a woody cylindrical pale brown tap-root; stems prostrate or erect (in depauperate specimens), up to 6 dm. long, usually branching sympodially. Stems, petioles, rachises, petiolules and axes of the inflorescences sparsely to densely strigillose or hirtellous to short-strigose or hirsutulous, or sometimes both strigillose and short-strigose or hirtellous and hirsutulous with cinereous or rarely golden hairs. Leaves erect (from prostrate stems) or ascending, 3–28 cm. long, the petioles of the principal leaves 0.3 (in occasional erect plants) to 9.5 cm. long, usually 1–4 times the length of the lowermost leaflets of a leaf; stipules of the lower leaves oblanceolate, acute, to 11.5 mm. long, 2 mm. wide, those of the upper leaves decreasing in size, lanceolate or linear, acute or acuminate, persistent; leaflets of the principal leaves 7–*13*–19, narrowly cuneate to narrowly cuneate-oblong or narrowly elliptic to elliptic, the apex obtuse or retuse, mucronate, often reflexed upward, the terminal leaflet (including the petiolule) 18–52 mm. long, (2–)5–13 mm. wide, the lateral leaflets (including the petiolules) 12–40(–45) mm. long, 2–18 mm. wide, the leaflets dull, glabrous or sparsely to moderately strigillose or hirtellous with fine gray hairs above, sparsely to moderately strigillose or hirtellous to short-strigose or hirsutulous with cinereous hairs beneath, the veins prominent, often reddish. Principal inflorescences apparently opposite the leaves, the smaller inflorescences axillary or terminal, 3.5–23 cm. long, curving upward, often exceeding the leaves, leafless, bearing flowers at 1–6 (rarely 7) nodes, the peduncle flattened, particularly below the nodes, 2-edged, up to 2(–3) mm. wide; buds 2–5 at a node, 1–3 flowering, 1 or 2 fruiting. Primary bracts narrowly oblanceolate to linear, the apex acute, the bract of the first node 3.5–8 mm. long, green, persistent; secondary bracts to 5.5 mm. long. Pedicels (3–)5–12 mm. long, ascending. Dried flowers 10–16 mm. long. Calyx 3–4.5 mm. long, strigillose or hirtellous with cinereous hairs, the upper lobes narrowly deltoid-acuminate, 1.5–2.5 mm. long, the lateral lobes lance-subulate, 1.5–3 mm. long, the lowermost lobe linear-subulate, 2.5–3.5 mm. long. Corolla white (the back of the banner yellowish, faintly veined with red) becoming pink and then carmine with age and purple upon drying; blade of the banner subquadrate to suborbicular, 10–13 mm. high, 11–15 mm. wide, finely hairy on the back, the claw 2–2.5 mm. long; wings 11–15 mm. long, auriculate, the claw 1.5–2 mm. long; keel 10–12 mm. long, with or without an auricle, the claw 2.5 mm. long. Staminal tube 8–9 mm. long, the vexillary stamen free from the tube, usually with a thickening on the upper side near the base. Ovary strigillose; ovules 10–15. Legume slightly curved downward, 3–4.5(–5) cm. long, 4–6 mm. wide, horizontal or ascending, sparsely to moderately strigillose or hirtellous with cinereous hairs; seeds 10–14, subspherical, 2–2.4 mm. in diameter, gray mottled with black or brown. Somatic chromosomes 22.

DISTRIBUTION. Well-drained, usually open, light, sandy, acid soils in pine and oak woods and barrens on the Coastal Plain from Moore and Carteret Counties, North Carolina, southward to Dade and Lee Counties,

Florida, and westward to Orleans and St. Tammany Parishes, Louisiana, United States. Map 11.

Representative specimens. Citations have, in most instances, been limited to a single collection from each county. UNITED STATES. North Carolina. Brunswick Co.: 3.5 mi. n.e. of Bolivia on Route 17, *Wood & Clement 7951* (GH, DUKE). Carteret Co.: 4.5 mi. west of Morehead City, *Wood & Clement 7025* (GH, DUKE). Hoke Co.: along Drowning Creek, *Correll 1154* (DUKE). Moore Co.: 2 mi. south of Pine Bluff, *Wiegand & Manning 1547* (GH). New Hanover Co.: Carolina Beach, *Godfrey 4704* (DUKE, GH, NY, US). Richmond Co.: 4 mi. east of Hamlet, *Wiegand & Manning 1548* (GH), 5 mi. east, *Heller 14012* (DS). Sampson Co.: 1.5 mi. from county line [Harnett?] on Highway 55, *R. Hood 154* (part) (UC). Scotland Co.: Springfield, *Godfrey 5095* (DUKE, GH).

South Carolina. Aiken Co.: 10 mi. north of Aiken, *Wood & Clement 7589* (GH). Beaufort Co.: Beaufort, *Wood & Clement 7107* (GH). Charleston Co.: Route 17, 14.8 mi. east of the Edisto River, *Wood & Clement 7089* (GH). Chesterfield Co.: 2 mi. south of McBee, *Wood & Clement 7601* (GH). Darlington Co.: Hartsville, *Norton*, 1920 (US). Florence Co.: 5 mi. north of Coward, *Wiegand & Manning 1550* (GH). Georgetown Co.: 15.25 mi. north of Georgetown on Route 17, *Wood & Clement 7075* (GH). Horry Co.: 15.8 mi. north of Myrtle Beach on Route 17, *Wood & Clement 7071* (GH). Kershaw Co.: 3 mi. n.e. of Camden, *Wood & Clement 7598* (GH). Lexington Co.: 14 mi. south of Columbia, *Godfrey & Tryon 1311* (CAS, DUKE, GH, MO, NY, US).

Georgia. Appling Co.: 3 mi. north of Baxley, *Wood & Clement 7560* (GH). Decatur Co.: Flint River at West Bainbridge, *Harper 1238* (GH, NY, US). Dougherty Co.: near Albany, *McKellar*, 1937 (GA). Baker Co.: Flint River at Ichanochaway Creek, *Duncan 6647* (GA). Echols Co.: Mayday, *McKellar*, 1937 (GA). Emanuel Co.: 3 mi. north of Oak Park, *Wood & Clement 7575* (GH). Lanier Co.: Lakeland, *McKellar*, 1937 (GA). Liberty Co.: 4 mi. s.w. of Hinesville, *Wiegand & Manning 1522* (GH). McIntosh Co.: 5 mi. north of Darien, *Wood & Clement 7117* (GH). Toombs Co.: 7 mi. south of Lyons, *Wood & Clement 7563* (GH). Ware Co.: 2 mi. n.e. of Waycross, *Erlanson 294* (UC).

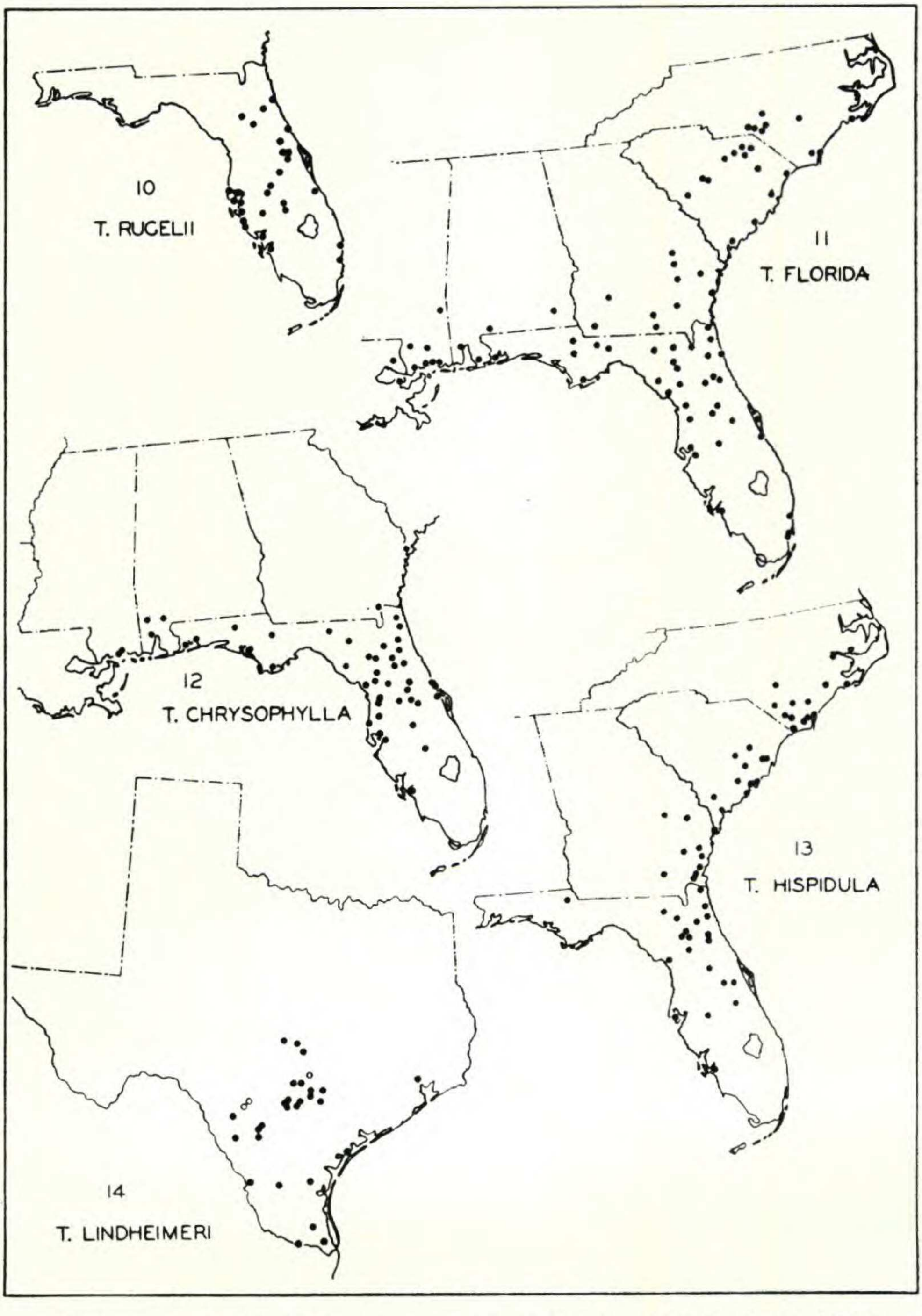
Florida. Alachua Co.: High Springs, *Wood & Clement 7539, 7540* (GH). Baker Co.: McClenny, *Futch*, 1936 (FLAS). Bay Co.: Lynn Haven, *Billington 19* (US). Brevard Co.: Eau Gallie, *Curtiss 584* (GH, MO, NY, US), *5708* (FLAS, GH, KCS, MO, NY, POM, UC, US), *Wood & Clement 7202* (GH, DUKE), *G. Bates*, 1889 (F). Broward Co.: between Ft. Lauderdale and Miami, *Small, Carter & Small*, 1911 (NY). Calhoun Co.: Blounttown, *Erlanson 226* (US). Clay Co.: Green Cove Springs, *Wood & Clement 7153* (GH). Citrus Co.: 10 mi. south of Dunellon, *Wood & Clement 7527* (GH). Columbia Co.: 5 mi. north of High Springs, *Wood & Clement 7546* (GH). Dade Co.: Buena Vista, *Moldenke 776a* (DUKE, NY, PENN); Miami, *O'Neill 8170* (CAS, F, UC, US); Ross-Costello Hammock, *Small, Mosier & Small 6568* (DUKE, FLAS, NY,

PENN, WVA). Duval Co.: near Jacksonville, *Curtiss 583* (GH, MO, NY, PENN, PH, TENN, UC, US), *4228* (DS, POM, NY, US). Escambia Co.: Pensacola, *McFarlane*, 1905 (PENN). Franklin Co.: Apalachicola, *Chapman* (MO), *Sausman* (PENN). Gadsden Co.: Quincy, *H. Foster*, 1936 (FLAS). Hernando Co.: 15 mi. north of Brooksville, *Crevasse*, 1940 (FLAS). Hillsborough Co.: Riverview, *Wood & Clement 7513* (GH). Jackson Co.: 4 mi. east of Marianna, *Erlanson 229* (UC, US), *230* (US). Lake Co.: Eustis, *Nash 819, 1555* (GH, MO, NY, UC, US), *Hitchcock*, 1894 (F, FLAS, KSC, MO). Lee Co.: north of Estero, *Wood & Clement 7504* (GH). Leon Co.: Tallahassee, *Rugel*, 1843 (part) (MO). Levy Co.: Rosewood, *Garber*, 1876 (US). Marion Co.: 1 mi. east of Orange Springs, *West & Arnold*, 1941 (FLAS). Madison Co.: *Hitchcock*, 1898 (F). Nassau Co.: just north of the Nassau River on U. S. Route 17, *Wood & Clement 7144* (GH). Orange Co.: Lake Brantley, *Lewton*, 1894 (F, NY, PH). Polk Co.: Bartow, *Buswell*, 1919 (MIAMI). Putnam Co.: Crescent City, *Martin*, 1880 (MO). St. John Co.: St. Augustine, *M. Reynolds*, 1877 (NY). Suwanee Co.: 5 mi. west of Live Oak, *Wiegand & Manning 1553* (GH). Volusia Co.: DeLand, *Hulst*, 1891 (NY).

ALABAMA. Baldwin Co.: 8 mi. north of Fairhope, *Erlanson 205* (F). Dale Co.: *Biltmore Herb. 4682b* (NY). Escambia Co.: Atmore, *Blanton 195* (part) (GH). Mobile Co.: Spring Hill, *Bush 92* (NY), *Drushel*, 1915 (MO). MISSISSIPPI. Hancock Co.: Bay St. Louis, *Langlois*, 1883 (DS, NY). Harrison Co.: Biloxi, *Tracy & Lloyd 156* (GH, NY). Jackson Co.: Ocean Springs, *Pollard 1011* (MO, NY, US). Pearl River Co.: Poplarville, *Erlanson 170* (GH, US). Stone Co.: 1 mi. north of Ramsey Hotel, *Brenner*, 1940 (MO). Waynesboro, *Pollard 1255* (MO, NY, US). LOUISIANA. St. Tammany Parish: Abita Springs, *Pennell 4136* (NY, PENN, PH); Covington, *Bro. Arsène 1164, 11071, 11466, 11474, 11580, 11860* (US). Orleans Parish: New Orleans, *Drummond 84* (GH), *Ingalls* (NY).

Tephrosia florida, as it occurs throughout much of its range, is a plant with prostrate stems and erect or ascending leaves with very long petioles, some of which may be as much as four times as long as the lowermost leaflets of a leaf. The few-flowered inflorescences are usually produced sympodially and curve upward. However, an erect, apparently depauperate form, with very short petioles and ascending, often axillary inflorescences, occurs sporadically. It may, nevertheless, be recognized as this species by the size and shape of the calyx, the strongly flattened two-edged axes of the inflorescences, and the hirtellous legumes.

Very young or depauperate forms of *Tephrosia florida* have been mistaken for *T. hispidula*, especially in the western part of the range of the former species, but may be separated, even in



Distributions of some barbistyled species of TEPHROSIA in the United States. MAP 14. Dots, T. LINDHEIMERI; circles, Texas collections of T. POTOSINA; see also MAP 18, page 323.

flower, by the very short hairs only 0.2–0.4 mm. long on both ovary and pod.

The very narrow-leaved plant known as *Tephrosia ambigua* var. *gracillima* B. L. Robinson appears to be only a local variation without clear morphological or geographical limits. I have seen it at the type-locality at Eau Gallie, Brevard County, Florida, (where the typical form has also been collected) and, with slightly broader leaves, near Estero, Lee County, on the other side of the peninsula.

The four pubescence-forms encountered in *Tephrosia onobrychoides* and *T. hispidula* occur sporadically nearly throughout the range of *T. florida* without showing definite geographical segregation. Three of the four types occur in the most northeasterly colony known (Carteret Co., N. C.) and the same three are found in the neighborhood of Miami, Florida, at the extreme south of the range of the species. I have, however, seen no herbarium specimens from Alabama and Louisiana (where I have no field-acquaintance with the species) with spreading pubescence, although plants with the leaflets either glabrous or pubescent above appear to occur together throughout the area. The absence of such plants in Alabama and Louisiana may well be more apparent than real.

Galega villosa Michx. of "Carolina ad Florida" usually has been interpreted as either *Tephrosia spicata* (Walt.) T. & G. or *T. chrysophylla* Pursh. Michaux' description is insufficiently definite to determine which of the several species of the southeastern United States he had. However, a photograph in the Gray Herbarium of the type-specimen in the Paris Museum clearly shows *Galega villosa* Michx. to be the present species. This name, *Galega villosa* Michx. (1803), is a later homonym of *G. villosa* L. (1753). In spite of this Persoon made combinations under his genus *Tephrosia* (1807) for both the Michaux and Linnaean names. Under these circumstances the combination *Tephrosia villosa* (L.) Pers., based on the valid name, should stand. This combination is currently used for an Asiatic plant which has been designated as the type-species of the conserved genus *Tephrosia*.

Dietrich in 1817 described *Galega florida*, apparently as a substitute for *G. villosa* Michx. His Latin description is identical

with that of Persoon's *T. villosa* which was abridged from Michaux' original brief description. Dietrich added a German translation of the Latin. There can be no doubt that *Galega florida* F. G. Dietr., as described, is synonymous with *G. villosa* Michx. The original description is as follows:

2. *Galega florida* Diet. Amerikanische Geisraute.

Tephrosia (villosa) prostrata villosissima, foliolis cuneato-obovalibus, spic. suboppositifoliis paucifloris, legum. oblongis. Mich. amer. 2. p. 68.

Der Stengel is auf der Erde hingestreckt und mit weichen Haaren dicht bekleidet; er trägt gefiederte Blätter, deren Blättchen keilförmig-oval sind, und wenigblümige Aehren, die den Blättern gegenüberstehen. Die Hülse ist länglich.

Vaterland: Nordamerika, Carolina und Florida.

Dietrich here properly supplied a new name for *G. villosa* Michx., a later homonym of *G. villosa* L., although he did not really indicate that this was his reason for doing so. He did, however, know of the earlier *G. villosa* L., for it is listed in his Vollst. Lexik. Gaertn. und Bot. **4:** 260. 1804, to which the above work is an addition. Later, however, in 1838 (in his Neuer Nachtr. Vollst. Lexik. Gaertn. und Bot. **8:** 553), after having accepted *Tephrosia* Pers., he placed his *G. florida* in the synonymy of *Tephrosia villosa* (L.) Pers., and placed *G. villosa* Michx. in that of *T. prostrata* Nutt., along with *T. chrysophylla* Pursh. From this later split it may be argued that Dietrich did not know what he was doing and that he did not intend to substitute the name *G. florida* for *G. villosa* Michx. However, since he obviously knew of the previous *G. villosa* L. and since he actually did supply a new name for *G. villosa* Michx., a later homonym, *Galega florida* F. G. Dietr. seems to be a perfectly valid name which it is necessary to use. Most unfortunately this old name must replace the well-known *Tephrosia ambigua* (M. A. Curtis) Chapm., but there appears to be no other alternative, now that *Galega villosa* Michx. is known to be this species.

19. **Tephrosia chrysophylla** Pursh

Tephrosia chrysophylla Pursh, Fl. Amer. Sept. **2:** 489. 1814. "Georgia, *Enslen*."

Galega chrysophylla (Pursh) Steud. Nom. ed. 1. 350. 1821.

Cracca chrysophylla (Pursh) Kuntze, Rev. Gen. **1:** 174. 1891.

Tephrosia prostrata Nutt. Gen. N. Amer. Pl. **2:** 210. 1818. "Common around Savannah in Georgia in dry and sandy woods" (PH-Type).

Cracca chrysophylla Chapmanni Vail, Bull. Torr. Cl. **22:** 34. 1895. "St. Joseph's, Florida," [Pasco County], *Chapman*, (NY-Type; GH).

Tephrosia chrysophylla var. *Chapmanni* (Vail) B. L. Robinson, Bot. Gaz. **28:** 198. 1899.

Cracca Chapmanni (Vail) Small, Fl. Southeastern U. S. 612, 1331. 1903.

Cracca Carpenteri Rydb. N. Amer. Fl. **24:** 172. 1923. "Pine woods," Pensacola, Escambia County, Florida, *Dr. Carpenter 44*, June 1838 (NY-Type).

Tephrosia Carpenteri (Rydb.) Killip, Jour. Wash. Acad. Sci. **26:** 360. 1936, as *Carpinteri*.

Completely prostrate perennial herb from a woody crown and ligneous, cylindrical tap-root; stems one to several, branching sympodially, up to 1 m. long. Stems, petioles, rachises, petiolules and axes of the inflorescences strigillose or both hirtellous and hirsutulous or sparsely hirsute with rusty or cinereous hairs. Leaves prostrate, 1.2–6.5 cm. long, nearly sessile or with petioles up to 5 (rarely 7 mm.) long; stipules often persistent, lanceolate or linear-lanceolate, 2–6 mm. long; leaflets (3–)5–7(–9 or very rarely 11), cuneate, obovate-cuneate, or narrowly so, or occasionally obovate to nearly orbicular, mucronate, the terminal leaflet 8–30(–35) mm. long, 6–20 mm. wide, often conspicuously larger than the lateral, the lateral leaflets 7–28 mm. long, 4–15 mm. wide, somewhat coriaceous, shining when fresh, green, glabrous (or rarely finely hirtellous with golden-brown hairs) above, moderately to densely strigillose and short-strigose beneath with cinereous to golden-brown hairs, usually appearing silky. Inflorescences opposite the leaves (or terminal late in the season), 1.5–19 cm. long, exceeding the leaves, prostrate, slightly angled to somewhat flattened, leafless, bearing flowers at 1–8 nodes; buds 2–3 at a node, 1 or 2 of these flowering. Primary bracts lanceolate to subulate-lanceolate or occasionally ovate and obtuse, 2–6 mm. long, persistent. Pedicels 3–10 mm. long, ascending. Dried flowers 10–15 mm. long. Calyx hirtellous or strigillose or both hirtellous and hirsutulous with whitish or (on the lobes) bronzy hairs, 5–6 mm. long, the upper lobes lanceolate, acute or acuminate, 2.5–4 mm. long. Corolla white (the back of the banner pinkish or faintly lined with red), becoming pink and then carmine in age and purple upon drying; blade of the banner subquadrate or orbicular, 11–13 mm. high, 12–14 mm. broad, silky on the back, the claw 2.5 mm. long; wings 12–14 mm. long, auricled, the claw 1.5–2 mm. long; keel 9–13 mm. long, the claw 2–2.5 mm. long. Staminal tube 10–11 mm. long, the vexillary stamen completely free, without a distinct thickening on the upper side near the base. Ovary densely strigillose; ovules 9–13. Legume nearly straight, borne parallel to the surface of the ground, (2.2–)3.2–5.5 cm. long, 4–5.5 mm. wide, strigillose or hirtellous with antrorsely directed hairs; seeds 6–13, subspherical, 2.4–3 mm. in diameter, brown mottled with black. Somatic chromosomes 22. Flowering collections from mid-May through September.

DISTRIBUTION. Prostrate on well-drained, sandy soils usually in full

sun in open oak and pine woods, Chatham (where not recently collected) and Charlton Counties, Georgia, south to Highlands and Lee Counties, Florida, and west to Harrison County, Mississippi, United States. Map 12.

SPECIMENS EXAMINED. UNITED STATES. GEORGIA. *Dr. Boykin* (NY); inter frutices in arenosis, *Beyrich 161* (MO, NY). Chatham Co.: Savannah, *John Forbes* (NY), *Nuttall* (PH). Charlton Co.: between Spanish Creek and Traders Hill, *Harper 1497* (GH, NY, US). FLORIDA. *Buckley* (GH, MO, NY); *Chapman* (GH, MO, NY, US); *Torrey & Gray* (GH); *Nash 553, 753* (NY). Alachua Co.: *Hitchcock*, 1898 (MO); near Gainesville, *Murrill*, 1939 (DUKE), *West 5* (FLAS); High Springs, *Wood & Clement 7534* (GH). Bay Co.: Lynn Haven, *Billington*, 1921 (US). Bradford Co.: 10 mi. south of Starke, *Dennison & Arnold*, 1946 (FLAS). Brevard Co.: Indian River City, *Wood & Clement 7196* (GH). Citrus Co.: 3 mi. s.s.w. of Inverness, *Wood & Clement 7525a* (GH); 11 mi. n.e. of Red Level, *West & Arnold*, 1941 (FLAS). Clay Co.: Green Cove Springs, *Wood & Clement 7151* (GH); Gold Head Branch State Park, *West*, 1939 (FLAS). Dixie Co.: 2 mi. south of Shamrock, *Erlanson 243* (US); 10 mi. west of Shamrock, *Pasture Survey*, 1937 (FLAS). Duval Co.: South Arlington, *Lighthipe 608* (NY); *Pieters 53* (GH), *44* (US); *Curtiss*, 1876 (US); Jacksonville, *Curtiss 582* (CAS, GH, MO, NY, PH, UC, US), *2825* (US), *4229* (DS, NY, UC, US), *4824* (GH, NY, UC, US), *Fredholm 225* (POM); 2 mi. south of Nassau Co. line on U. S. Route 17, *Wood & Clement 7146* (DUKE). Escambia Co.: Pensacola, *Carpenter 44* (NY). Franklin Co.: Apalachicola, *Chapman* (MO). Hernando Co.: Highway 41 near Citrus Co. boundary, *Wood & Clement 7524* (GH); hillside near Chisegut Hill Bird Sanctuary, 3 mi. south of Citrus Co. line on route 41, *Wood & Clement 7521* (GH). Highlands Co.: Avon Park, *Buswell*, 1936 (MIAMI); Sebring, *Small & West*, 1934 (FLAS); Lake Jackson, Sebring, *McFarlin 8114* (NY). Hillsborough Co.: 1 mi. south of Riverview, *Wood & Clement 7514* (GH); Tampa, *Henshall* (F), *Ferguson*, 1898 (MO), *Garber*, 1877 (GH, PH, US), 1876 (NY, US), *Britton & Wilson 12* (NY); Long Island, Tampa Bay, *Rugel*, 1845 (NY). Holmers Co.: Ponce de Leon, *Knight*, 1944 (FLAS). Lake Co.: Astor Park, *Wood & Clement 7176* (GH); Eustis, *Gandoger*, 1900 (MO), *Nash 811* (GH, MO, NY, UC, US), *1964* (NY, US), *Hitchcock*, 1894 (F, FLAS, KSC, MO). Lee Co.: Myers, *Hitchcock 81* (GH, MO, NY, US). Levy Co.: 2 mi. south of Lebanon Station, *Pasture Survey*, 1937 (FLAS). Liberty Co.: Bristol, *Chapman* (MO, US); just north of Bristol, *West & Arnold*, 1940 (FLAS); Roy, *Wiegand & Manning 1554* (GH). Madison Co.: *Hitchcock*, 1898 (F, MO). Marion Co.: 3 mi. south of Orange Springs, *West & Arnold*, 1942 (FLAS); 16 mi. south of Ocala, *Erlanson 249* (GH, US); 20 mi. south of Gainesville, *Erlanson 244* (GH, UC-part). Orange Co.: *Buswell*, 1932 (MIAMI); *Fredholm 5364* (GH); Lake Brantley, *Lewton*, 1894 (NY); Clarcona, *Pieters 53* (US), *Meislahn 141* (US); south of Wekiva Springs, *Moldenke 5359* (NY); west of Bithlo on Route 50, *Wood & Clement 7192* (GH); Orlando, *Davis*, 1934 (FLAS); just south of Tangerine, *Wood & Clement*

7189 (GH). Pasco Co.: St. Joseph, *Chapman* (GH, NY); 15 mi. s.s.w. of Brooksville (Hernando Co.), *Wood & Clement 7520* (GH). Polk Co.: *Schallert 16503* (NY, US); Lake Alfred, *Bottimer 497* (US). Putnam Co.: Johnson, *Barnhart 1275* (NY); 3 mi. south of Clay Co. line on U. S. Route 17, *Wood & Clement 7169* (GH); Welaka, *Laessle*, 1940 (FLAS). Santa Rosa Co.: Choctawahatchee National Forest, east of Milton, *Erlanson 216* (US). Suwanee Co.: 5 mi. west of O'Brien, *Arnold & West*, 1946 (FLAS). Volusia Co.: 6 mi. south of New Smyrna, *Butts & Ames 528* (GH).

ALABAMA. Baldwin Co.: Tensaw, *Tracy 8014* (GH, NY). Mobile Co.: Mobile?, *Mohr* (F); Mobile, *Baker*, 1897 (KSC, MO, NY); 16 mi. north of Mobile, *Erlanson 183* (US); 2 mi. north of Citronella, *Erlanson 202* (US); Spring Hill, *Mohr*, 1897 (US), *Bush 298* (NY, US). MISSISSIPPI. Harrison Co.: Beauvoir, *Tracy 4911* (GH, MO, NY, US); Bond's Point, *Tracy 4437* (US); west of bay, Biloxi, *Pennell W4389* (PENN); 1 mi. east of Mississippi City, *Pennell 4354* (NY, PENN).

Tephrosia chrysophylla is a characteristic species of open, well-drained, sandy soils of Florida. The completely prostrate habit, combined with the few, usually cuneate or obovate leaflets and the very short petioles, is distinctive.

Plants smaller than normal in varying degrees have received specific names for which there seems no justification. Those with leaflets 1–1.5 cm. long are *Cracca Carpenteri* Rydb., but such plants occur in peninsular Florida with the ordinary type, the leaflets of which are 0.8–3 cm. long. *Cracca Chapmanni* (Vail) Small is known only from two specimens collected by Chapman. These plants are reduced in size in all their parts, but are particularly conspicuous in their small leaflets, 5–15 mm. long, and their pods, 2 cm. long and 3–4 mm. wide. Since these specimens were collected well within the range of *T. chrysophylla* and since they differ only in size, they should be regarded, in the absence of other evidence, merely as a form of the species. Chapman (as many another botanist of his time and later) seems to have taken a particular interest in collecting aberrant forms and many peculiar and fragmentary plants are represented in his collections.

The three collections cited from Highlands County, Florida, need further investigation. These are atypical in that the upper surfaces of the leaflets are hirtellous, while the leaflet-number varies from five to eleven. The leaflets are somewhat smaller and more uniform in size than is usual in *Tephrosia chrysophylla* and the plants themselves are slightly reminiscent of *T.*

Rugelii, although the habit is evidently prostrate. Coming from the southern edge of the range of *T. chrysophylla* but within the area of *T. Rugelii* as they do, these specimens suggest the interesting possibility of hybridization of these two species.

19a. **Tephrosia chrysophylla** × **Tephrosia florida**

Cracca intermedia Small, Bull. Torr. Cl. **21:** 303. 1894. "Near Jacksonville," Duval County, Florida, *A. H. Curtiss 4231*, 31 May, 11 July 1893 (NY-Type; DS, UC, US).

Cracca Smallii Vail, Bull. Torr. Cl. **22:** 33. 1895. Illegitimate; substituted for *C. intermedia* because of *Tephrosia intermedia* Graham, 1828, a name which had never been transferred to *Cracca*.

Tephrosia Smallii Robinson, Bot. Gaz. **28:** 198. 1899, as comb. nov., but a new name based on *Cracca intermedia* Small, not *Tephrosia intermedia* Graham, 1828.

Cracca floridana Vail, Bull. Torr. Cl. **22:** 35. 1895. "Central Florida," *G. V. Nash 494½, 1198, 1263, 1334, 1552, 1615*, (probably all collected in the vicinity of Eustis, Lake County, Florida); *1552*, vicinity of Eustis, 1–15 August 1894 (NY-Cotypes; *1552*-GH, MO, UC, US).

Intermediate between *Tephrosia chrysophylla* and *T. florida*. Perennial from a woody crown and brown cylindrical woody tap-root; stems prostrate, branching sympodially, spreading, leafy from the base, generally terete. Stems, petioles, rachises, petiolules and axes of the inflorescences hirtellous, strigillose or hirtellous and hirsutulous with brown or cinereous hairs. Leaves usually ascending, but sometimes prostrate, or rarely erect, 5–10 cm. long, the petioles of the principal leaves 5–19 mm. long, (1/5–) 1/3–7/9 of the length of the lowermost leaflets (including petiolules) of a leaf, some or all more than 1/3 the length of the lowermost leaflets; stipules lanceolate to linear, acute or acuminate, 2–8 mm. long, up to 2 mm. wide, persistent; leaflets of the principal leaves 7–11(–13), averaging 9, cuneate to oblong-obovate to narrowly elliptic, the apex rounded to retuse, mucronate, the terminal leaflet 16–32 mm. long, 7–19 mm. wide, the lateral leaflets 12–28 mm. long, 5–14 mm. wide, the lowermost usually smallest, the leaflets of living plants dull, with the texture of *T. florida*, lacking the luster of *T. chrysophylla*, glabrous (or very rarely hirtellous) above, moderately strigillose or strigillose and short-strigose or rarely hirtellous beneath, not sericeous. Inflorescences opposite the leaves, generally exceeding them, 6–22 cm. long, prostrate or occasionally slightly assurgent, leafless, bearing flowers at 1–6 nodes, the peduncle strongly flattened and 2-edged as in *T. florida*, especially below the first node; buds 2 or 3 at a node, 1 or 2 of these flowering. Primary bracts persistent, that of the first node 2–5 mm. long, decreasing in size at the upper nodes. Dried flowers 10–15 mm. long. Calyx 3.5–4 mm. long, intermediate between or resembling either parent, more often *T. florida*. Corolla white, as in the parents; blade of the banner 13 mm. high, 11 mm. wide; wings about 13

mm. long with a blunt auricle on the upper side. Legume straight or slightly curved downward, hirtellous or strigillose with cinereous hairs, few of the ovules developing, the seeds 2–5; mature seeds not seen.

DISTRIBUTION. Open, well-drained sandy soils occupied by both presumed parents in Georgia, Florida and Alabama, United States.

SPECIMENS EXAMINED. UNITED STATES. GEORGIA. Without locality, *Dr. Boykin* (NY). FLORIDA. Without locality, *Chapman* (GH, MO, NY, OKL); *Nash 1334* (NY). Duval Co.: near Jacksonville, *Curtiss*, 31 May 1893 (MO), *Curtiss 4231*, 31 May, 11 July 1893 (DS, NY, UC, US); oak scrubs in dry pine barrens, *Curtiss 4825*, 31 July 1894 (FLAS, GH, MO, NY, UC). Franklin Co.: dry sand ridges, Apalachicola, *Saurman*, 1867 (F, PENN). Hernando Co.: white sand in long-leaf pine and *Quercus laevis* woods on hill on Highway 41 near the Citrus Co. boundary, *Wood & Clement 7523*, 9 Aug. 1947 (FLAS, GH). Hillsborough Co.: white sand in openings in *Quercus virginiana* woods, 1 mi. south of Riverview, *Wood & Clement 7515*, 8 Aug. 1947 (GH). Lake Co.: vicinity of Eustis, *Nash 1552*, 1–15 Aug. 1894 (GH, MO, UC, US); probably in the vicinity of Eustis, *Nash 494½, 1198, 1263, 1615* (NY); vicinity of Eustis, *Hitchcock*, June–July 1894 (F). Marion Co.: in oak-scrub palmetto-flats, *Erlanson 244* (part), 28 May 1935 (UC). ALABAMA. Mobile Co.: Spring Hill, *Bush 296*, 1 Aug. 1897 (NY-part, US), *92*, 3 Aug. 1897 (US); Spring Hill, *Mohr*, 18 May 1896, 1897 (US); under scrub-oak and long-leaf pine, 18 mi. north of Mobile, *Erlanson 190*, 24 May 1935 (US).

Although Small pointed out in the description of *Cracca intermedia* that his "species" was intermediate between *C. ambigua* (*T. florida*) and *C. chrysophylla* (*T. chrysophylla*), the possibility of a hybrid origin of this plant does not appear to have been suggested. In the summer of 1947, however, plants strikingly intermediate between *Tephrosia florida* and *T. chrysophylla* and very like the type-collection of *Cracca intermedia* were found in two localities in peninsular Florida growing with the presumed parents. In both instances, only these two species of *Tephrosia* were present, along with relatively few plants of the putative hybrid. The intermediate nature of these plants and other presumed hybrids is indicated in the accompanying table.

Since "*Cracca intermedia*" occurs with both *T. chrysophylla* and *T. florida* in the absence of other species, since it occurs sporadically and only within the overlapping ranges of both species, and since it is morphologically intermediate between the two species, it seems safe to postulate the hybrid-character of these plants even in the absence of experimental evidence.

Cracca floridana Vail supposedly differed from *C. intermedia* in

T. florida	*C. intermedia*	*T. chrysophylla*
Stems prostrate, leaves erect.	Stems prostrate, leaves usually ascending at an angle, occasionally prostrate or erect.	Entire plant completely prostrate.
Leaflets 7–*13*–19, thin, dull.	Leaflets 7–*9*–11(–13), thin, dull.	Leaflets 3–*7*–9, somewhat coriaceous, shining.
Leaflets narrowly cuneate to narrowly oblong-cuneate, narrowly elliptic or linear-elliptic.	Leaflets cuneate to oblong-obovate or narrowly elliptic.	Leaflets cuneate, obovate-cuneate, or oblong-obovate, occasionally obovate to nearly orbicular.
Terminal leaflet 18–52 mm. long, 5–13 mm. wide; lateral leaflets 12–45 mm. long, 2–18 mm. wide.	Terminal leaflet 16–32 mm. long, 12–28 mm. wide; lateral leaflets 12–28 mm. long, 5–14 mm. wide.	Terminal leaflet 8–30 mm. long, 6–20 mm. wide; lateral leaflets 7–28 mm. long, 4–15 mm. wide.
Petioles 1–4 times the length of the lowermost leaflets of the leaves.	Petioles usually 1/3–7/9 of the length of the lowermost leaflets.	Petioles usually very short, less than 1/3 the length of the lowermost leaflets.
Axes of inflorescences strongly flattened, 2-edged, assurgent.	Axes of inflorescences flattened, 2-edged, prostrate or somewhat assurgent.	Axes of inflorescences sometimes slightly flattened, always prostrate.
Calyx 3–4.5 mm. long.	Calyx 3.5–4 mm. long, intermediate in shape or resembling *T. florida*.	Calyx 5–6 mm. long.

its assurgent habit, but Robinson (1899, p. 193) pointed out that the evidence is all to the contrary and concluded that *C. intermedia* and *C. floridana* represent variations of the same entity. In this he seems thoroughly justified. Miss Vail may have been misled by a Louisiana collection, "New Orleans, Dr. Ingalls," (NY), cited by her as one of the cotypes. This plant is the erect form of *Tephrosia florida* and not the plant under discussion here. If *Cracca floridana* is considered to be synonymous with *Cracca intermedia*, whoever desires to apply a "specific" name to these plants must make the proper combination under *Tephrosia* with *Cracca floridana* Vail as the basonym. *Nash 1552* would be the appropriate Type; the other cotypes are apparently represented only at NY. There would appear, however, to be little justification for applying a specific name to a hybrid of this kind.

It seems likely that the isolating mechanism between *Tephrosia chrysophylla* and *T. florida* is at least partially ecological.

Ordinarily *T. chrysophylla* seems to tolerate considerably drier, hotter and more open situations (particularly in oak-barrens where it usually occurs prostrate in openings on the white sand) than does *T. florida*. The latter species occurs more often in somewhat grassier and more shaded situations, which are probably also slightly moister. Occasionally, however, the two occur together, as at the localities cited in Hillsborough and Hernando Counties, Florida, and it is in areas such as these that the putative hybrids are found.

A second hybrid of *Tephrosia chrysophylla* is apparently represented by collections from Astor Park, Lake County, Florida. Here perfectly typical *T. chrysophylla* (*Wood & Clement 7176*) grew on the open white sand of a road embankment and *T. spicata* (*Wood & Clement 7178*) a few feet away at the edge of brush in a live-oak and saw-palmetto woods. Various scattered plants collected along the roadway combined characteristics of both of these species. One of these (*7181a*) had prostrate leaves with 7–9 (primarily 9) leaflets of intermediate shape with the pubescence of *T. chrysophylla* and the ascending inflorescences of *T. spicata* (those of *T. chrysophylla* are always borne parallel to the surface of the ground). Another plant (*7180b*) resembled *T. chrysophylla* still more, but bore 7–9 leaflets and inflorescences which were either prostrate or ascending at the tip. Five plants were found with prostrate leaves, bearing 5–11 leaflets (mostly 7–9) of intermediate shape, with the upper surfaces of the leaflets hairy and the inflorescences strongly ascending. All of these specimens seem to indicate various combinations of the characters of both *T. chrysophylla* and *T. spicata* and suggest repeated hybridization at this locality. Here again it may be noted that these two species do not ordinarily occur in the same habitat and that this may be an example of the breakdown of an ecological barrier through the agency of man.

20. **Tephrosia tepicana** Standl.

Cracca tepicana Standl. Contr. U. S. Nat. Herb. **20:** 217. 1919. Tepic, Nayarit, Mexico, *Edward Palmer*, 5 Jan.–6 Feb. 1892 (US 305316-Type).
Tephrosia tepicana Standl. Field Mus. Publ. Bot. **4:** 214. 1929.

Decumbent herbaceous or suffrutescent perennial; stems slender, ca. 2 mm. in diameter, flexuous, nearly terete near the base, often acutely angled above and almost triangular. Stems, petioles, rachises and petiolules thinly hirsutulous, hirtellous or strigillose with whitish hairs, or

nearly glabrous. Leaves apparently either prostrate or ascending, 6–16 cm. long, the petioles 1–35 mm. long, shorter than the leaflets of the lowermost pair, the rachis (0.7–)2–10 cm. long; stipules subulate or linear, long-acuminate, 3–13 mm. long, less than 1 mm. wide, brown, persistent, ascending; leaflets of the principal leaves 5–11, elliptic-oblong, elliptic or oval-oblong to lanceolate or elliptic-lanceolate, the upper leaflets largest, 30–59 mm. long, 13–30 mm. wide, the lowermost pair smallest, (12–)20–55 mm. long, (8–)12–23 mm. wide, the leaflets rounded or subcordate at the base, the apex retuse, obtuse or acute, mucronate; leaflets thin but rigid, with the midrib impressed, green, dull or somewhat shining, thinly strigillose to hirtellous and glabrate above, thinly hirtellous to strigillose below with whitish hairs 0.2–0.6 mm. long, or short-strigose to hirsutulous along the midrib, the margins undulate, sometimes subcrenate, ciliate with cinereous hairs ca. 1 mm. long, these often deciduous; petiolules 1.5–2.5 mm. long. Inflorescences terminal or axillary, probably sometimes appearing to be opposite the leaves, leafless, ascending, slender, (2–)4–22 cm. long, the peduncle (1.5–)2.5–9 cm. long, the axis of the inflorescence thinly strigillose to nearly glabrous, usually flattened and 2-edged, few-flowered, the (3–)5–18 flowering nodes often crowded distally; buds 3–5 at a node, 2–3 of these flowering. Primary bracts linear-subulate, 3–9 mm. long, persistent, brown; secondary bracts linear-setaceous, 1–4 mm. long. Pedicels 4–7 mm. long, slender, ascending. Dried flowers ca. (12–)15 mm. long. Calyx 4.5–5 mm. long, strigillose to hirtellous, the lobes deltoid or deltoid-ovate, abruptly short-acuminate, the upper lobes 1.5–2 mm. long, the lateral 2 or 3 mm. long, the lowermost ca. 2 mm. long. Flower-color unknown, brown or purplish in dried specimens; blade of the banner apparently oval, ca. 11 mm. high, 16 mm. broad, strigillose on the back with fine silky golden hairs, the claw ca. 3 mm. long; wings 13–15 mm. long, 4–5 mm. wide, slightly auricled, the claw 2 mm. long; keel 14–15 mm. long, 6 mm. deep, rounded at the apex, slightly auriculate at the base, the claw ca. 3 mm. long. Staminal tube 9–10 mm. long, the vexillary stamen lightly coherent with the staminal tube or free, somewhat thickened on the upper side near the base. Ovary densely strigillose, silky. Nearly mature pod almost straight, with a slightly down-curved beak, ca. 6 cm. long, 6 mm. wide, hirtellous to strigillose with cinereous hairs 0.2–0.4 mm. long; seeds 10 or 11, the mature seeds unknown. Flowering collections January to February.

DISTRIBUTION. Southern Sinaloa and Nayarit, Mexico. Map 24.

SPECIMENS EXAMINED. MEXICO. SINALOA: Vicinity of Balboa, Municipalidad San Ignacio, *J. G. Ortega 1209* (MEXU); Balboa, *Ortega 5104*, Jan. 1925 (US); Mazatlán, *Ortega 5081*, Jan. 1923 (US). NAYARIT: Tepic, *Palmer*, 5 Jan.–6 Feb. 1892 (US).

Tephrosia tepicana is easily recognized by habit, leaflet-number and -shape, and calyx. The vexillary stamen appears to be free from the staminal tube, but the present paucity of flowering

material leaves this in doubt. This little-collected species appears to be related to *Tephrosia madrensis* which is known from a single collection, presumably from the Sierra Madre of this same region.

21. **Tephrosia madrensis** Seem.

Tephrosia madrensis Seem. Bot. Voy. Herald 280. pl. 61. 1856. "Sierra Madre, Mexico" (between the cities of Mazatlán and Durango or Durango and Tepic in Sinaloa, Durango or Nayarit), *Seemann 2186*, Nov. 1849–Feb. 1850 (K-Type).

Cracca madrensis (Seem.) Kuntze, Rev. Gen. **1:** 175. 1891, basonym misattributed to Benth.

Galactia marginalis Seem. Bot. Voy. Herald pl. 61. 1856, not Benth.

Decumbent, suffruticose perennial; stems prostrate, about 2 dm. long from a slender woody crown, nearly terete below, 2 mm. in diameter, angular above. Stems, petioles, petiolules, stipules and axes of the inflorescences thinly strigillose with cinereous hairs or nearly glabrous. Leaves unifoliolate, the petioles (5–)7–15 mm. long; stipules linear, acuminate, 5–10 mm. long, persistent, brown; leaflets elliptic or oblong-elliptic, acute, obtuse or rounded at apex and base, mucronate, the principal leaflets 25–50 mm. long, 12–23 mm. wide, thin but coriaceous, glabrous above or with a few short appressed hairs along the midrib and lateral veins, the veins prominent, reticulate, the leaflets paler below, sparsely strigillose with cinereous hairs 0.2–0.4 mm. long; petiolules 1–2 mm. long. Inflorescences terminal and axillary, the terminal leafless, 9–10 cm. long, the peduncle 1.5–3.5 cm. long, one inflorescence with a short lateral branch from the lowermost node; axillary inflorescences short, 2–3 cm. long, with a single leaf; axes of the inflorescences stiff, flattened (1.5–2 mm. wide) below the 2–9 flowering nodes, 2-edged, the terminal inflorescence exceeding the leaves; buds ca. 5 at a node, probably 2 or 3 of these flowering. Primary bracts lanceolate or linear-lanceolate, acuminate, 5–10 mm. long, rigid, brown, persistent; secondary bracts linear, acuminate or subulate, 3–5 mm. long, persistent. Pedicels 9–11 mm. long, slender, ascending. Dried flowers about 15 mm. long. Calyx campanulate, 3.5–5 mm. long, thinly strigillose with rusty and cinereous hairs, the tube 2–2.5 mm. long, the upper lobes subulate, 1–2.5 mm. long, the lateral and lowermost triangular-lanceolate, acuminate, 1.5–3 mm. long. Flower-color unknown, the dried flowers brown; blade of the banner suborbicular, ca. 12 mm. in diameter, retuse, strigillose on the back with silky brownish hairs; wings ca. 14 mm. long, auricled; keel ca. 13–14 mm. long, exauriculate. Staminal tube ca. 8.5–11 mm. long. Ovary strigillose along the sutures, the valves nearly glabrous; ovules ca. 6. Mature fruit and seeds unknown; young legume sparsely strigillose on the valves, strigillose along both sutures with minute hairs 0.2 mm. long.

Distribution. Known only from the type-locality.

Specimen examined. MEXICO. Sinaloa, Durango or Nayarit:

"Sierra Madre" (between the cities of Mazatlán and Durango or Durango and Tepic), *Seemann 2186*, Nov. 1849–Feb. 1850 (K).

The nearly glabrous, thin but rigid, unifoliolate leaves are characteristic. If the mature pod, when collected, proves to be glabrous, it will supply an additional conspicuous character. *Tephrosia madrensis* appears to be most closely related to *T. tepicana* and to an undescribed species from Guatemala represented by *Steyermark 51790* (F) (see Standley & Steyermark 1946, p. 356).

22. **Tephrosia Lindheimeri** A. Gray

Tephrosia Lindheimeri A. Gray, Bost. Jour. Nat. Hist. **6:** 172. 1850. "Muskit prairies, on the Liano," [Llano County?], Texas, *Lindheimer Distrib. No. 592*, Aug. 1847 or 1848 (GH-Type; MO, NY, US).

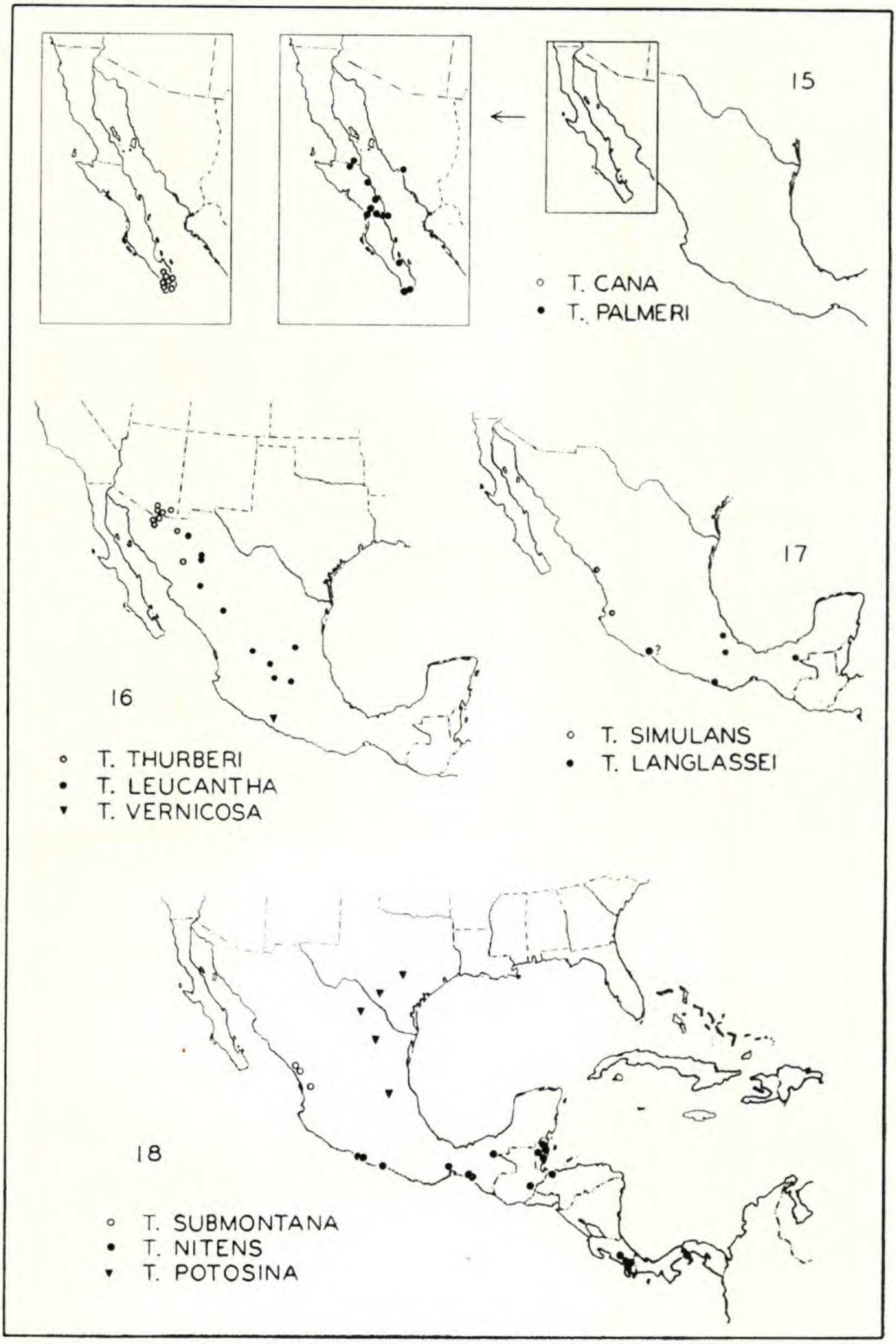
Cracca Lindheimeri (A. Gray) Kuntze, Rev. Gen. **1:** 175. 1891.

Prostrate or decumbent perennial herb from a woody crown and woody cylindrical tap-root (–1.5 cm. thick); stems several, up to 1 m. long, somewhat flexuous, branching sympodially or partially so, terete or angled. Stems, petioles, rachises and peduncles of the inflorescences hirtellous to hirsutulous with soft dense whitish ascending or spreading hairs. Leaves 5–15(–20) cm. long, ascending; petioles (1.6–)2.5–4.5 cm. long, shorter or (more often) longer than the lowermost leaflets of a leaf; stipules linear, acuminate, 12 mm. or less long, striate, becoming brown, often deciduous; leaflets of the principal leaves (5–)7–15(–19), mostly 9–11, obovate to broadly obovate-cuneate, or nearly orbicular or elliptic, the apex obtuse, retuse or emarginate with a slender mucro, (11–)18–33(–37) mm. long, (7–)12–21(–27) mm. broad; leaflets thin but somewhat rigid, dull, grayish-green, densely strigillose to short-strigose or hirtellous to hirsutulous with white hairs to nearly glabrous with but a few appressed hairs around the margins above, moderately to densely hirtellous to hirsutulous with fine ascending hairs below, appearing hoary or silky, the margins of the leaflets conspicuously bordered with short white antrorsely directed hairs, the veins conspicuous, pale to brownish beneath; petiolules 1–3 mm. long. Inflorescences terminal, either opposite the leaves or at the ends of axillary branches which may overtop the primary branches, 7–30 cm. long, ascending to erect, leafless, the flowering nodes 3–18; buds 4 or 5 at a node, 2 or 3 flowering and fruiting. Primary bracts lanceolate, long-acuminate, to linear-lanceolate, 8–10 mm. or less long, inconspicuous, deciduous, falling soon after anthesis; secondary bracts linear-lanceolate, 2–4 mm. long, deciduous. Pedicels slender, becoming stout in fruit, (4–)5–9 mm. long, ascending. Dried flowers 13–15 mm. long. Calyx 5–6 mm. long, hirsutulous with soft white hairs, the upper lobes deltoid, short-acuminate, 2–3 mm. long, the lateral lobes deltoid-lanceolate, acute, 3–4 mm. long, the lowermost lobe lanceolate, acuminate, keel-like, 4–6 mm. long. Corolla rose-purple, the banner with a white spot near the base of the

blade; blade of the banner suborbicular to rounded-quadrate, 11–13 mm. high, 12–15 mm. broad, hirtellous to hirsutulous with white hairs on the back, the claw 3 mm. long; wings 10–15 mm. long, with a small deltoid auricle, the claw 3 mm. long; keel 13–15 mm. long, with or without an auricle, the claw 3–3.5 mm. long. Staminal tube 10–11 mm. long, the vexillary stamen coherent with the tube along the middle third, flat, without an angular callosity on the upper side near the base. Ovary densely silky, hirtellous or strigillose; ovules 5–6. Legume shaped roughly like a long parallelogram, somewhat curved and narrowed near the base, (2.5–)4–5 cm. long, 7–8.5 mm. broad, horizontal or ascending, stramineous, moderately to densely hirtellous with soft white hairs, appearing velutinous; seeds (1–)4–6, oblong to suborbicular in outline, the ends often flattened by crowding, plump or flat, 5–7 mm. long, 4–5 mm. wide, stramineous to dirty tan, unmarked. Somatic chromosomes 22. Flowering collections from early April to September.

DISTRIBUTION. Well-drained sandy, decomposed granite or limestone soils, roadsides, grassy areas and open oak woods or mesquite stands, southern Texas from Burnet and Llano Counties to Harris, Zavala and Cameron Counties and perhaps (?) with an isolated station in Cooke County. Map 14.

SPECIMENS EXAMINED. UNITED STATES. TEXAS. Without definite locality: *C. Wright* (GH, NY, US); *Nealey*, 1888 (DS); *Wilkinson 177* (MO); from Bexar to the Rio Grande, *Berlandier 958* (MO), *2388* (GH, MO), *3133* (GH, MO, NY, US). Aransas Co.: Rockport, *Shulz*, 1938 (F). Bexar Co.: Applewhite Road, 18 mi. south of San Antonio, *Sister Mary Metz 626* (NY); San Antonio (TEX); s.w. of San Antonio, *Tharp*, 1926 (TEX); 15 mi. south of San Antonio, *Shulz 439* (US). Burnet Co.: Granite Mt. (DS, MO); granite region of Burnet, *Reverchon 1664* (MO); Burnet, *Fisher 3626* (CAS, US); s.e. corner of Burnet Co., *Hill 27* (US). Cameron Co.: *Bailey 242* (US). Comal Co.: New Braunfels, *Dapprich 6861* (SMU). Cook Co.?: Gainesville (county not indicated on label) (this station omitted from map), *E. Russell*, 1933 (UC). Dimmit Co.: Carrizo Springs, *Hoglund*, 1930 (TEX); east of Carrizo Springs, *M. E. Jones 28558* (DS, GH, MO, POM, UC, US). Duval Co.; Peña Station, *Havard*, 1884 (F, GH). Frio Co.: 14 mi. south of Pearsall, *Shreve 9445* (GH); Dilley, *Innes & Moon 1310* (GH, MO, TEX); Dilley, *Reverchon*, 1905 (OKL); along highway just n.e. of Dilley on Route 81, *Moore & Wood 3617* (GH, UC, Bailey Hortorium); sandy upland in open mesquite stand near semi-permanent pool, *Wolcott & Barkley*, 1946 (MO, PENN, TEX). Gonzales Co.: *Bogush 1305* (GH, TEX); *Normand*, 31 May 1929 (TEX, UC); 5 mi. n.w. of Westoff, *Muller 8016* (SMU); *Bogush*, 1926 (NY), *1305* (US); Ottine, *Cory 5709* (GH, POM). Guadalupe Co.: ca. 10 mi. south of Seguin, *Webster & Rowell 7095* (TEX); 13 mi. south of Seguin, *Wolcott & Barkley 16T435* (TEX); in limestone soil, Seguin, *Groth 181* (CAS, F, GH, NY, US). Harris Co.: open woods near the San Jacinto River, east of Houston, *Small & Wherry 11805* (NY). Hidalgo Co.; Rio Grande Valley, *M.*


15
T. CANA
T. PALMERI
16
T. THURBERI
T. LEUCANTHA
T. VERNICOSA
17
T. SIMULANS
T. LANGLASSEI
18
T. SUBMONTANA
T. NITENS
T. POTOSINA

Walker 71 (TEX, UC). Kleberg Co.: Kingsville, *Sinclair*, 1940 (TEX). LaSalle Co.: near Cotula, *Perkins & Hall 2323* (POM); Millett, *Trelease*, 1897 (MO). Llano Co.: between Enchanted Rock and Llano, *Tharp*, 1936 (GH, SMU, UC); near Enchanted Rock, *Whitehouse*, 1930 (TEX). Llano Co.?: "muskit prairies on the Llano," *Lindheimer 592* (GH, NY, MO, US), Oct. 1847 (GH, MO). Webb Co.: Laredo, *E. Palmer 258*, 1879 (GH), *250*, 1880 (US). Willacy Co.: along roadside, north of Raymondville, *Clover 1198* (NY). Wilson Co.: Wisdom Ranch, 20 mi. east of San Antonio, *Cutler 3225* (MO); Kicaster School, *Parks R2328* (MO); along San Antonio Highway at Wilson-Bexar County line, *Drushel 9857* (NY, US); 7 mi. n.w. of La Pryor, *Hedrick 272* (UC).

Tephrosia Lindheimeri is discussed with the following species.

23. **Tephrosia potosina** Brandeg.

Tephrosia potosina Brandeg. Univ. Calif. Publ. Bot. **4:** 272. 1912. Near Rascón, San Luis Potosí, Mexico, *C. A. Purpus 5273* (UC-Type; GH, MEXU, MO, NY, US).

Cracca potosina (Brandeg.) Standl. Contr. U. S. Nat. Herb. **23:** 472. 1922.

Decumbent perennial herb from a slender woody crown and heavy woody tap-root 1.5 cm. thick; stems 1 to several, sympodial or partially so, somewhat flexuous, slender (–2.5 mm. thick), up to 5 dm. long, axillary branches often poorly developed. Stems, petioles, rachises and peduncles of the inflorescences hirsutulous with spreading, often somewhat retrorse, tawny, rusty or sordid hairs. Leaves 7–22 cm. long, ascending; petioles (1.5–)2.5–10 cm. long, longer than the lowermost leaflets; leaflets 3–9, predominantly 5–7, obovate to broadly obovate-cuneate or orbicular, the apex obtuse or retuse, mucronate, 1–5 cm. long, 0.7–4(–4.5) cm. wide, dull, bluish-green, rigid but not coriaceous, completely glabrous above, moderately to very densely hirsutulous with ascending to spreading cinereous to tawny hairs, sometimes appearing pilose or silky, the margins of the leaflets bordered with usually inconspicuous tawny to rusty antrorsely directed hairs, the veins pale to reddish beneath. Inflorescences terminating either the main or axillary branches, erect or ascending, up to 27 cm. long. Dried flowers 13–20 mm. long; flower-dimensions as in *T. Lindheimeri;* corolla rose-purple with a green spot at the base of the blade of the banner. Pedicels, calyx and back of the banner usually hirsutulous with golden or rusty hairs. Ovules 4–8. Legume 2–5.5 cm. long, 6–8 mm. wide, stramineous to dirty brown, hirtellous with tawny, rusty or tan hairs; seeds (1–)4–8, suborbicular to subquadrate in outline, the ends sometimes flattened by crowding, plump, 4.5–5.5 mm. long, 4–5 mm. wide, stramineous, unmarked. Somatic chromosomes 22. Plants otherwise similar to *T. Lindheimeri*. Flowering collections from April to August.

DISTRIBUTION. Hays(?) and Uvalde Counties, Texas, United States, to Coahuila, Nuevo León and San Luis Potosí, Mexico. Maps 14 and 18.

SPECIMENS EXAMINED. UNITED STATES. TEXAS. Hays Co.?:

San Marcos and vicinity (county not noted), *S. W. Stanfield* (NY). Uvalde Co.: gravelly open ground, *E. J. Palmer 12296*, 18 June 1917 (GH, MO, NY, US); rocky banks along Leana River, near Uvalde, *E. J. Palmer 33665*, 30 Apr. 1928 (GH, MO, NY, PH, US); dry rocky ground, Sabinal, *E. J. Palmer 10246*, 19 June 1916 (DS, MO, US).

MEXICO. Coahuila: Hacienda La Rosita, Muzquiz, *Wynd & Mueller 298*, 26 June 1936 (A, MO, NY, US); Muzquiz, *E. Marsh 50*, 1935 (F, GH, TEX), *1152*, Apr. 1938 (GH). Nuevo León: Sierra Madre near Monterrey, *Pringle 2796*, 29 May 1889 (GH, MEXU, US); Diente Canyon (ca. 12 mi. south of Monterrey), Sierra Madre, Monterrey, *C. & M. Mueller 512*, 11 July 1933 (F, TEX), *512*, 23 July 1933 (A); Horsetail Falls, 38 km. (23 mi.) south of Monterrey on Pan-American Highway, *C. & E. Frye 2463*, 25 Apr. 1939 (GH, UC, US); limestone soil (?), weedy hillside pasture between Cieneguilla and Hacienda Vista Hermosa on road from Pan-American Highway to Horsetail Falls (Cola de Caballo), ca. 38 km. south of Monterrey, *Moore & Wood 3618*, 28 June 1948 (GH, UC, Bailey Hortorium). San Luis Potosí: Rascón, *Purpus 5273*, Aug. 1911 (GH, MEXU, MO, NY, UC).

Tephrosia potosina and *T. Lindheimeri* constitute a pair of closely related but distinct species without obvious close relationships with any other American members of the genus. The combination of characters by which they stand apart includes the sympodial decumbent habit, obovate to orbicular leaflets, rose-purple flowers, cohering vexillary stamen, broad pods, and few (4–8), large, stramineous, unmarked seeds. The two occupy contiguous ranges and appear to be the only species of the barbi-styled group which occur at least partially on soils derived from calcareous rocks. These two species are, however, distinct from each other in a number of particulars set forth in the accompanying table. The most conspicuous of these differences are those related to stature and to number and pubescence of the leaflets.

Although entire plants of *Tephrosia Lindheimeri* are seldom collected, when this species is seen in the field the much longer stems and more robust habit are conspicuous in comparison with the relatively slender and short stems of *T. potosina* (which in all of the herbarium-specimens seen have been collected with a part of the slender, woody crown). In the single colony of each which I have studied this habital distinction was very striking. Although from the available herbarium-specimens ecological conditions might be suspected of being responsible for the relatively small size of plants of *T. potosina*, all indications were to the

	T. Lindheimeri	*T. potosina*
Stature	Coarse, stems to 1 m. long, 5 mm. thick.	Slender, stems to 0.5 m. long, 2.5 mm. thick.
Leaves	5–15(–20) cm. long.	7–22 cm. long.
Petioles	(1.6–)2.5–4.5 cm. long, pubescence ascending or spreading, cinereous.	(1.5–)2.5–10 cm. long, pubescence often spreading-retrorse, often rusty.
Leaflets	(5–)7–15(–19), predominantly 9–11.	3–9, predominantly 5–7.
	11–37 mm. long, (7–)12–21 (–27) mm. wide.	10–50 mm. long, 7–40(–45) mm. wide.
Indument of upper surfaces of leaflets	Densely strigillose or hirtellous to hirsutulous or short-strigose with cinereous hairs, to nearly glabrous with only a few appressed hairs around the margins; margins conspicuously bordered with white hairs.	Completely glabrous; margins inconspicuously bordered with tawny or rusty hairs.
Flowers	Banner with a white spot at the base of the blade.	Banner with a green spot at the base of the blade.
	Calyx and back of banner with white or cinereous hairs.	Calyx and back of banner with golden or rusty hairs.
Ovules and seeds	5–6	4–8

contrary, with plants of this species less than one-half the size of fruiting plants of *T. Lindheimeri* (as seen in Texas) fruiting abundantly in a habitat seemingly far better suited than Texas to profuse growth.

The 3–9 (predominantly 5–7) leaflets of *Tephrosia potosina* are a very constant character. On some 90 plants examined in a colony near Monterrey (*Moore & Wood 3618*) no leaves bore more than 9 leaflets. In *T. Lindheimeri*, however, the leaflet-number varies from 5 to 19, with 9–11 occurring most commonly.

Although the indument of the leaflets has proved to be untrustworthy in a number of species of *Tephrosia*, in this instance leaflet-pubescence shows perfect correlation in all of the available material with the leaflet-numbers given above. Within a single colony of *Tephrosia Lindheimeri*, plants with the upper surfaces of the leaflets evenly hirsutulous, or with the center of the leaflets glabrous, or grading from this to the restriction of the whitish hairs to a narrow submarginal zone are encountered. Although

several collections show some very nearly glabrous leaflets, there are always a few appressed whitish hairs near the margins of the leaflets, in addition to the conspicuous edging of antrorsely directed whitish hairs on the margins themselves. The leaflets of *Tephrosia potosina*, however, are always completely glabrous above and the marginal border of tawny to rusty hairs is inconspicuous. In addition to the herbarium-material, mass collections from 129 plants of *T. Lindheimeri* (*Moore & Wood 3617*) and 90 of *T. potosina* (*Moore & Wood 3618*) showed no exceptions.

Further examination of fresh flowering material is desirable before much significance can be assigned to the color of the spot at the base of the banner. The color of hairs on calyx and back of the banner does, however, seem to be of diagnostic importance in these two species.

24. **Tephrosia saxicola** sp. nov.

Planta perennis herbacea decumbens. Caules graciles basi sublignosi, 1–5 dm. longi, sparso-strigillosi. Folia 3–9 cm. longa; petioli (2–)5–17 mm. longi; stipulae lineari-acuminatae, persistentes; foliola 9–19, angustato-elliptica, oblonga vel lineari-oblonga, mucronata, (8–)10–23 mm. longa, 3–6(–8) mm. lata, coriacea, supra nitida, glabra vel nervus primarius strigillosus, subtus substrigillosa pilis albidis, pallida vel canescentia. Inflorescentiae terminales vel axillares, 3–20 mm. longae, laxae, ascendentes plerumque efoliatae; nodi floriferi 5–20. Bracteae primariae lineari-lanceolatae vel subulatae, 4–8 mm. longae, brunneae, persistentes. Pedicelli 4–9 mm. longi. Calyx campanulatus, 4–5.5 mm. longus, strigillosus pilis aureis et cinereis; lobi deltoidei vel deltoideo-ovati, abrupte acuminati, lobi superiores 1–1.5 mm. longi, lobi laterales 2.5–3 mm. longi, lobus infimus 3 mm. longus. Vexillum roseo-purpureum, basi macula viridia; lamina 11–13 mm. longa, 13–14 mm. lata; alae 13–15 mm. longae; carina 13–14 mm. longa, ungue 3 mm. longo. Tubus staminalis 10–11 mm. longus; stamen vexillare tubo connatum, basi liberum. Ovarium strigillosum, 6–9-ovulatum; stylus barbatus. Legumen immaturum 3 cm. longum, 5 mm. latum, raro-strigillosum pilis cinereis.

Decumbent perennial herb, somewhat woody at the base; stems slender, 1–5 dm. long, clustered, much branched, monopodial, terete below, somewhat angled above, striate. Stems, petioles, rachises and axes of inflorescences thinly strigillose with whitish hairs. Leaves 3–9 cm. long, spreading or ascending, the petioles (2–)5–17 mm. long, mostly shorter than the lowermost leaflets, the rachis (0.5–)2.5–5.5 cm. long, both petiole and rachis channeled on the upper side; stipules linear, acuminate, 10 mm. or less long, brown, persistent; leaflets of the principal leaves 9–19, narrowly elliptic to oblong or linear-oblong, (8–)10–23 mm. long, 3–6(–8) mm. wide, the base and apex acute to rounded; leaflets coriaceous, lustrous, glabrous or with a few short white hairs along the midrib and nearly lacking stomata above, moderately white-strigillose beneath, appearing pale or canescent; petiolules 0.5–1.5 mm. long, strigillose. Inflorescences terminal and axillary, 3–20 cm. long, ascending, slender, often lax, sometimes with 1–3

short branches from the axils of bracts, leafless or the lowermost node with a leaf, the peduncle 1–4 cm. long, the axis angular, the flowering nodes 5–20, rather evenly spaced; buds 3–4 at a node, 2–3 of these flowering. Primary bracts linear-lanceolate to subulate, 4–8 mm. long, brown and persistent, conspicuous; secondary bracts subulate, 2–4 mm. long, brown, persistent. Pedicels 4–9 mm. long, ascending, strigillose with golden or rusty hairs. Dried flowers 13–15 mm. long. Calyx campanulate, 4–5.5 mm. long, strigillose with fine golden or rusty and cinereous hairs, the tube 2.5–3 mm. long, the lobes triangular to triangular-ovate, rather abruptly acuminate, the upper 1–1.5 mm. long, the lateral 2.5–3 mm. long, the lowermost 3 mm. long. Corolla "bright pink-lavender", the banner with a conspicuous green area near the base; blade of the banner 11–13 mm. high, 13–14 mm. broad, strigillose on the back with fine silky golden hairs, the claw 3–4 mm. long; wings 13–15 mm. long, 4–5 mm. broad, auricled, the claw 2.5–3 mm. long; keel 13–14 mm. long, 6–7 mm. deep, the claw 3 mm. long. Staminal tube 10–11 mm. long, the vexillary stamen coherent with the tube, free at the base, with a prominent callosity on the upper side near the base. Ovary strigillose, the style barbate; ovules 6–8. Mature fruit not seen, the immature legume ca. 3 cm. long, 5 mm. wide, slightly curved upward, thinly strigillose with cinereous hairs. Fig. 1, Plate 1153.

Distribution. Known only from the type-locality. Map 19.

Specimens examined. MEXICO. Sinaloa: Caespitose, suffrutescent, spreading herb with bright pink-lavender flowers, open rocky slope with lower pines and oaks, 4500 ft. (1400 m.), Puerto a Tamiapa, Dto. de Badiraguato, *H. S. Gentry 5812*, 5 March 1940 (GH-Type; DS, MEXU, MO, NY, UC) (see Gentry 1946 for map and exact location).

Tephrosia saxicola is clearly distinguished by the 9–19 small, coriaceous leaflets, by the slender, often elongate inflorescences with persistent bracts, and by the deltoid to deltoid-ovate lobes of the calyx. The short, thin and tightly appressed pubescence also appears to be characteristic. This species is probably most closely related to *T. Seemannii*, but that poorly known species has very short inflorescences, narrowly triangular, subulate calyx-lobes and very much longer pubescence.

25. **Tephrosia Seemannii** (Britten & Bak. f.) K. Schum.

Cracca Seemanni Britten & Bak. f. Jour. Bot. **38:** 16. 1900. "In woods, Sierra Madre", (between Mazatlán and Durango or Durango and Tepic, in Sinaloa, Durango or Nayarit), Mexico, *Seemann 2191*, Nov. 1849–Feb. 1850 (K, GH).

Tephrosia Seemannii (Britten & Bak. f.) K. Schum. in Just, Bot. Jahresb. **28**(1)**:** 442. 1902.

Herbaceous or suffruticose perennial from a slender crown; stems ap-

parently decumbent or erect, 1.5–4 dm. long, terete or somewhat angled above, striate, 1–2 mm. thick, slightly flexuous, often with short axillary branches 1.5–7 cm. long. Stems, petioles, rachises, petiolules, inflorescences, pedicels and calyces sparsely to densely strigillose with fine white or gray hairs and sparsely to densely covered with coarser spreading hairs up to 2 mm. long. Principal leaves spreading, 2.2–5.5 cm. long, the petioles (1.5–)2–6 mm. long, shorter than the lowermost leaflets, the rachis 1.5–4 cm. long; stipules linear, long-acuminate to linear-subulate, 4–8 mm. long, brown and persistent; leaflets of the principal leaves 9–21, narrowly oblong-elliptic to lanceolate-oblong or oblong, the base usually obtuse or rounded, rarely narrowed, the apex acute, obtuse or rounded, rarely retuse, mucronate, tapering evenly or slightly broader below the middle, 7–15 mm. long, 2.5–5.5 mm. wide, those near the center of the leaf longest, the lowermost shortest; leaflets coriaceous, the margins usually slightly involute, the midvein conspicuously impressed, the parallel lateral veins obscure, the veinlets between somewhat impressed, forming a network, the areoles not elongate but more or less isodiametric; upper epidermis lacking stomata; upper surface of leaflets with very fine appressed to ascending hairs 0.2–0.6 mm. long, becoming more or less glabrous except along the midrib; lower surface of leaflets densely strigose with white or cinereous hairs, the midrib conspicuous, brown or reddish, with scattered spreading hairs about 1 mm. long, appearing somewhat silky but not shining or silvery; petiolules inconspicuous, ca. 0.6 mm. long. Inflorescences terminating the main branches or short leafy axillary branches, 1–4 cm. long, the peduncle up to 1.2 cm. long, the inflorescences few-flowered with 2–7 flowering nodes; buds ca. 3 at a node, 2 or 3 flowering. Primary bracts linear to linear-lanceolate, acute or acuminate, often 3-toothed, brown, persistent, 4–7 mm. long; secondary bracts linear-subulate, 3–5 mm. long, brown, apparently persistent. Pedicels slender, ascending, 4–11 mm. long. Dried flowers ca. 13–15 mm. long. Calyx ca. 6 mm. long, the upper lobes subulate, ca. 2 mm. long, the lateral and lowermost narrowly triangular-subulate, ca. 4 mm. long. Corolla "purple" (Seemann), apparently with a green spot at the base of the banner within, brown when dry; blade of the banner ca. 11 mm. high, finely white-hairy on the back, the claw ca. 2 mm. long; wings ca. 14 mm. long, ca. 4 mm. wide, the claw 2.5 mm. long; keel ca. 14 mm. long, exauriculate, the claw ca. 3.5 mm. long. Staminal tube 10–11 mm. long, the vexillary stamen coherent with the staminal tube, free at the base, thickened on the upper side near the base. Ovary strigillose or ascending-hirtellous with white hairs, the style barbate on the inner surface; ovules ca. 8. Very young legumes hirtellous with fine white or (along the sutures) rusty hairs; mature legumes and seeds unknown.

DISTRIBUTION. Mountains of southern Sinaloa and probably Nayarit, Mexico. Map 19.

SPECIMENS EXAMINED. MEXICO. SINALOA, DURANGO OR NAYARIT: In woods, Sierra Madre, (between the cities of Mazatlán and Durango or

Durango and Tepic), *Seemann 2191*, Nov. 1849–Feb. 1850 (GH, K). SINALOA: Sierra de Chabarria, *J. G. Ortega 4049*, 1921 (US).

This little-known species was thought by Seemann to be related to *Tephrosia virginiana*, a supposition in which he was followed by Britten and Baker and by Rydberg. It appears, however, that the real affinities of *T. Seemannii* are with *T. Pringlei* of central Oaxaca and *T. saxicola* of central Sinaloa; the resemblance to *T. virginiana* is superficial only. *Tephrosia Seemannii* strongly resembles *T. Pringlei* in the number, size and shape of the leaflets, which are finely hairy above and densely white-hairy beneath, but rather more coriaceous in the former species. The persistent bracts are also similar and floral measurements overlap. The two are clearly different, however, in the venation of the leaflets, in the distribution of stomata and in several other tendencies as indicated below. Until more material is available little dependence can be placed upon floral characters.

	T. Seemannii	*T. Pringlei*
Stems	1.5–4 dm. long.	1.2–5 dm. long.
Stipules	Linear, long-acuminate, to linear-subulate.	Linear, acute or acuminate.
Leaflets	9–21, narrowly oblong-elliptic to lanceolate-oblong or oblong, tapering evenly or slightly wider below the middle.	9–25, obovate, obovate-cuneate, narrowly cuneate or elliptic, usually broadest above the middle.
	Parallel lateral veins inconspicuous, the areoles between the lateral veins nearly isodiametric.	Parallel lateral veins conspicuous, the areoles between the lateral veins distinctly elongate.
	Upper epidermis without stomata.	Upper epidermis with stomata.
Nodes of the inflorescence	2–7	3–12

26. **Tephrosia Pringlei** (Rose) Macbr.

Cracca Pringlei Rose, Bot. Gaz. **40:** 143. 1905. Gravelly slopes under oaks, hills of Las Sedas, Dist. Etla, Oaxaca, Mexico, *C. G. Pringle 6741*, 22 July 1897 (US 42396-Type; CAS, GH, MEXU, NY, PH, UC, US).

Tephrosia Pringlei (Rose) Macbr. Field Mus. Publ. Bot. **4:** 87. 1925.

Much-branched herbaceous perennial from a slender branching woody crown and heavy woody root; stems many, 1–2.5 dm. long, apparently erect or somewhat decumbent, terete or somewhat angled, striate. Stems,

petioles, rachises, petiolules and axes of inflorescences moderately hirtellous to hirsutulous or strigillose to strigose with fine cinereous or brownish hairs. Principal leaves 2.5–6.5 cm. long, the petioles 2–8(–9) mm. long, the rachis 1.8–5 cm. long, stipules linear, acute or acuminate, 5–10 mm. long, 1–1.5 mm. or less wide, persistent, brown; leaflets of the principal leaves 9–25, obovate, obovate-cuneate, narrowly cuneate or elliptic, usually broadest above the middle, usually narrowed toward the base, the apex obtuse, rounded or retuse, mucronate, 5–15 mm. long, 2–5.5(–7) mm. wide, those of a leaf rather uniform in size, light green, firm, veiny on the upper side, the parallel lateral veins evident, the smaller veinlets forming elongate areoles between, the upper epidermis with stomata; upper surfaces of the leaflets nearly glabrous to sparsely to densely covered with fine cinereous hairs, at least the midrib with a few hairs, appearing silvery and silky or somewhat woolly below, the lower surfaces densely strigillose and strigose to hirsutulous with cinereous hairs. Inflorescences terminal (or occasionally 1–3 additional short inflorescences axillary), usually compact, 1.5–12 cm. long, few-flowered, leafless or one node with a leaf, the peduncle up to 5 cm. long, the flowering nodes 3–12; buds 3–5 at a node, 2 or 3 flowering, 1 or 2 fruiting. Primary bracts linear to linear-lanceolate, acuminate, 3–7 mm. long, persistent, brown; secondary bracts 2–4 mm. long, linear, persistent. Pedicels slender, 6–12 mm. long in flower, 10–16 mm. long in fruit, ascending. Dried flowers 14–20 mm. long. Calyx and pedicels usually doubly pubescent, hirtellous to strigillose and hirsutulous to short-strigose with cinereous or brownish hairs. Calyx 6–10 mm. long, the tube 2–3 mm. long, the upper lobes long-acuminate (2.5–)3.5–6 mm. long, the lateral and lowermost lanceolate, long-acuminate, 4–7 mm. long, usually nearly equal in length. Corolla in dried specimens purple to brown, the banner with a conspicuous yellowish-green spot near the base; blade of the banner suborbicular, 11–15 mm. high, 12–15 mm. wide, covered on the back with fine golden and white hairs, the claw 2–3 mm. long; wings 13–16 mm. long, 4–6 mm. wide, the claw 2–3 mm. long, not conspicuously auricled, but rounded at the base on the upper side and folded, thus appearing auriculate; keel semilunate, ca. 15 mm. long, exauriculate, the claw 2.5–3 mm. long. Staminal tube 10–12 mm. long, the vexillary stamen coherent with the tube, free at the base, thickened but not conspicuously so on the upper side near the base. Ovary densely strigillose or hirtellous with white or (along the margins) rusty hairs. Partially mature pod 4 mm. long, 6–6.5 mm. wide, the upper side slightly curved downward, tipped by the persistent style-base which curves downward, compressed, hirtellous with brown and white hairs; seeds 6–8, the mature seeds unknown. Flowering collections late June and July.

Distribution. Oak woods, 2000–2300 m., central Oaxaca, Mexico. Map 19.

Specimens examined. MEXICO. Oaxaca: San Fo. Huiso, 7000 ft., *Galeotti 3458*, June 1849 (US, NY); gravelly slopes under oaks, hills of Las Sedas, Dist. Etla, *Pringle 6741*, 22 July 1897 (CAS, GH, MEXU, NY,

PH, UC, US); La Carbonera, 2200 m., Dist. Etla, *Conzatti 4019*, 28 June 1920 (MEXU); Rancho Nopalera, Camino Montelobos, Dist. Nochixtlán, 2000 m., *Conzatti 1868*, 22 June 1907 (NY, US); Cerro de Nueve Puntas, Matatlán, Dist. Tlacolula, 2500 m., *Conzatti & Vazquez 1495*, 19–23 June 1906 (MEXU, NY, US); Cuatro Venados, Dist. Zimatlán, 7500 ft., *L. C. Smith 61*, 27 June 1894 (GH, US).

27. **Tephrosia nicaraguensis** Oerst. ex Benth. & Oerst.

Tephrosia nicaraguensis Oerst. ex Benth. & Oerst. Kjoeb. Vidensk. Meddel. **1853:** 6. 1854. Savannas between Granada and Masaya, Nicaragua, presumably *Oersted 4622*, Dec. 1847 (F, US).

Cracca nicaraguensis (Oerst. ex Benth. & Oerst.) Kuntze, Rev. Gen. **1:** 175. 1891.

Tephrosia talpa S. Wats. Proc. Amer. Acad. **22:** 405. 1887. "Río Blanco, on hillsides under pines, growing in clumps," (about 10 mi. west by north of Guadalajara), Jalisco, Mexico, *Edward Palmer 161*, July 1886 (GH-Type; MEXU, NY, US).

Cracca talpa (S. Wats.) Rose, Bot. Gaz. **40:** 143. 1905.

Erect perennial or suffrutescent herb 2–5(–10?) dm. high; stems many from a heavy woody crown and thick woody root, monopodial. Stems, petioles, rachises, petiolules and axes of the inflorescences densely hirtellous or hirsutulous (or both) with cinereous or tawny hairs, appearing velvety or woolly. Leaves ascending or spreading, (8–)12–24 cm. long, the leaflets often drooping, the petioles (11–)23–57 mm. long, longer or shorter than the lowermost leaflets, the rachises (5–)7–16 cm. long; stipules linear, acuminate, 6–17 mm. long, 1 or rarely 1.5 mm. or less wide, persistent, becoming brown; leaflets of the principal leaves 9–21, narrowly oblong to oblong to elliptic, (11–)16–50(–60) mm. long, (7–)8–17(–19) mm. wide, (1.5–)2–4 times as long as broad, the lowermost leaflets shortest, the apex of leaflets obtuse, rounded or retuse, short-mucronate, the base obtuse (often narrower than the apex, rarely acute); leaflets thickish, dull, densely soft-hirtellous with fine cinereous hairs, often appearing velutinous or canescent above, conspicuously reticulate between the lateral veins below with the areoles nearly isodiametric, hirsutulous, especially along the midrib and parallel lateral veins which are conspicuously outlined with whitish or tawny hairs, often appearing somewhat woolly or silky; petiolules ca. 2.5 mm. long. Inflorescences usually terminal, stout, straight, 5–35 cm. long, or accompanied by 1–5 slender inflorescences 2–15 cm. long from the upper axils, the uppermost leaf often with axillary flowers, the peduncles of the inflorescences 2–10 cm. long, angular, the inflorescences bearing 5–ca. 25 flowering nodes which are buttressed below; buds 5–12 at a node, 4 or more flowering, 1–3 fruiting. Primary bracts linear, acuminate, 6–14 mm. long, 1 (or rarely 1.5) mm. or less wide, persistent; secondary bracts linear-subulate, 3–5 mm. long, usually persistent. Pedicels 2–5(–6) mm. long, ascending. Dried flowers 14–18 mm. long. Pedicels and calyces densely hirtellous and hirsutulous with rusty to cinereous hairs. Calyx (4–)5–7 mm. long, the upper lobes acuminate, 1–2

mm. long, the lateral deltoid or narrowly so, short-acuminate, (1.5–)2.5–3 mm. long, the lowermost lanceolate, acuminate, (1.5–)4–5 mm. long. Banner white becoming pink with age, the wings and keel apparently rose-pink or the keel paler, the corolla usually brown when dry; blade of the banner suborbicular to obovate, 14–17 mm. high, 13–18 mm. wide, densely covered with fine silky hairs on the back, the claw 2.5–4 mm. long; wings 15–18 mm. long, 3–5.5 mm. wide, auricled, the claw ca. 3 mm. long; keel 15–17 mm. long, with or without an auricle, the claw 3 mm. long. Staminal tube 11–13 mm. long, the vexillary stamen coherent with the tube, free at the base, with a conspicuous 2-lobed thickening on the upper side near the base. Ovary densely silky- to woolly-hirsutulous. Legume nearly straight or slightly curved downward and often narrowed near the base, 3–6 cm. long, 5–6.5 mm. wide, densely hirsutulous with cinereous to rusty hairs (about 1–1.5 mm. long), the hairs often matted, woolly or furry in appearance; seeds 4–8, brown variegated with black, nearly orbicular or subquadrate in outline, 3.6–3.8 mm. in diameter, laterally compressed.

Distribution. Well-drained rocky soils in open oak and pine woods, 400–1750 m., from southern Sonora and southwestern Chihuahua to Chiapas and Oaxaca, in Mexico, and to Guatemala, Honduras, El Salvador and Nicaragua. Map 3.

Specimens examined. MEXICO. Chihuahua: Sunny oak slope, Sierra Canelo, Río Mayo, *Gentry 2527* (A, F, MO); oak savanna, Batopilillas, Río Mayo, *Gentry 2613* (A, F, MO) (see Gentry 1942 for map). Sonora: Valley of the San Ignacio River, *Capt. E. K. Smith* (NY); Sierra Verde, *Schott*, 1855 (NY, US). Sinaloa: In open places, Mesa de Lagunillas, Ixtagua, San Ignacio, 440 m., *Montes & Salazar 449* (US); Ixtagua, San Ignacio, *Ortega 484* (MEXU); Cerro Colorado [ca. 30 mi. east of Culiacán], *Brandegee*, 1904 (UC); open rocky slopes on oak savanna, Mesa Malqueson, Cerro Colorado, 2500 ft., *Gentry 5176* (DS, GH, MO, NY, UC); Cofradia [east of Culiacán], *Brandegee*, 21 Oct. 1904 (UC, US). Durango: *Rose 2261* (US); Ramos to Inde, *Nelson 4711* (NY, US); Durango & vicinity, *Palmer 632*, 1896 (GH, MO, NY, UC, US); rocky slope 35 km. south of Durango, *Hernandez X. X2584* (GH). Guanajuato: Oak zone, Dolores Hidalgo to Guanajuato, *Kenoyer 2116* (GH). Querétaro: Hacienda [del] Ciervo, between San Juan del Río and Cadereyta, *Rose, Painter & Rose 9694* (GH, MEXU, NY, US). Jalisco: Guadalajara, *Holway 5151* (US); near Guadalajara, *Rose & Painter 7471* (GH, NY, US); rocky hills near Guadalajara, *Pringle 5137* (GH, MEXU), *9774* (GH, MO, NY, US), *4396* (MO, NY, PH, UC, US); barranca of Río Blanco near Guadalajara, 4500 ft., *Pringle 11437* (GH, MEXU, US); on hillsides under pines, Río Blanco, *Palmer 161*, 1886 (GH, MEXU, NY, PH, US); near Tequila, *Rose & Hough 4753* (US); open grassy hillside with rocky volcanic outcrops near top of hill ca. 4–5 km. beyond Tequila on road to Tepic, 4500 ft., *Moore & Wood 4830* (GH, UC, Bailey Hortorium); rocky mountain slopes with open oak woods near Arenal on highway from Guadalajara to Tequila, 5300 ft., *Moore & Wood 4834*

(GH, UC, Bailey Hortorium). MÉXICO: Prairie, Volcán, Dist. Temascaltepec, 1410 m., *Hinton 1278* (GH, MEXU, NY, US). MORELOS: Woods near El Rodeo, *Clausen 6059* (DS, MEXU). GUERRERO: Clay soil, Valle Grande, Mont de San Cristobal (apparently in Dist. Montes de Oca), *Langlassé 324* (GH, US). OAXACA: *Holway 3679* (GH); Oaxaca, 1750 m., *Conzatti & Gonzalez 39* (MO, US); Natividad Road, n.e. of Oaxaca, *Kenoyer 1567* (GH); valley of Oaxaca, 5500–7500 ft., *Nelson 1456* (US); San Felipe and Monte Albano, *Rose & Hough 4577* (US, NY-photo); San Benito, near Apango, 500 m., *Reko 3619* (US); Talea (Chinantla), *Galeotti 3466* (GH, NY, UC, US); Faldas del Fortín, 1600 m., Dist. del Centro, *Conzatti 3578* (MEXU); Ferrenos de Xochimilco, 1560 m., Dist. del Centro, *Conzatti 3645* (MEXU). VERACRUZ: Region of Orizaba, Borrego, *Bourgeau 2797* (part) (US). CHIAPAS: Chicomuselo, 800 m., *Matuda 4425* (A, MO, NY); Hacienda Monserrate, *Purpus 9143* (F, MO, US); rocky mountain slope east of Hacienda Monserrate, *Purpus 10092* (NY, UC, US), *Clausen & Cervantes 6101* (DS, MEXU).

GUATEMALA. CHIQUIMULA: Grassy slope of Mount Tejás, near village of Sasmo, ca. 1 mi. n.w. of Chiquimula, 420–520 m., *Steyermark 30206* (F); dry, open, rocky slopes in openings of pine woods, Caracol Mountain, 1.5 mi. north of Quetzaltepeque, 1200–1400 m., *Steyermark 31375* (F). HUEHUETENANGO: Along Río Cuilco between Cuilco and aldea of San Juan, 2.5 mi. west of Cuilco, 1200–1300 m., *Steyermark 50867* (F). JUTIAPA: Oak and pine forest at La Pava below Acatempa, 1100 m., *Standley 77597* (F); open rocky pine forest, hills between Jutiapa and Plan de Urrutia, north of Jutiapa, 900–1200 m., *Standley 75602* (F); pine forest, low mountains west of Jutiapa, 900 m., *Standley 60565* (F). ZACAPA: Rocky, dry hills between Monte Grande and Santa Rosalía, 300–1200 m., *Steyermark 42191* (F).

HONDURAS. EL PARAISO: Dry rocky hillsides ca. 5 km. east of Ojo de Agua, 760 m., *Williams & Molina 10485* (UC).

EL SALVADOR. SANTA ANA: Fondo del Cerro de la Olla, near Chalcuapa, *Calderón 1009* (NY, US).

NICARAGUA. Between Granada and Masaya, *Oersted 4622* (F, US).

Although *Tephrosia nicaraguensis* and *T. talpa* have previously been recognized as separate species, the differences have been mainly political, specimens from Guatemala southward being referred to the former and those from Mexico to the latter name. The type-collections correspond in all particulars, however, and clearly represent the same species. Rydberg apparently did not see authentic material of *T. nicaraguensis*, so that the differences given by him (1923) seem to have come solely from the original incomplete descriptions of the two species. In spite of the broad range of this plant no geographical variations are evident.

28. **Tephrosia submontana** (Rose) Riley

Cracca submontana Rose, Contr. U. S. Nat. Herb. **8:** 46. 1903. Between Pedro Paulo and San Blascito, Nayarit, Mexico, *J. N. Rose 3336*, 4 Aug. 1897 (US 302312-Type; GH, MEXU; NY-photograph).

Tephrosia submontana (Rose) Riley, Kew Bull. **1923:** 341. 1923.

Erect herbaceous to shrubby perennial ca. 1 m. high. Stems, petioles, rachises, petiolules, and axes of the inflorescences densely strigillose or hirtellous with rusty-brown hairs, velutinous or silky. Leaves 9–22 cm. long, the petioles 6–25 mm. long, shorter than the lowermost leaflets, the rachis 5–14 cm. long; stipules linear, acute or acuminate, 5–15 mm. long, ca. 1 mm. wide, persistent but often broken in herbarium-specimens; leaflets (11–)13–17, lanceolate, lance-oblong, or linear-oblong, the base rounded or obtuse, the apex acute, cuspidate, 2–6 cm. long, (5.5–)8–15 mm. wide, somewhat coriaceous, green, shining, minutely pubescent with hairs 0.1–0.2 mm. long above, the veins conspicuous, densely strigillose to strigose beneath with fine golden or silvery shining hairs, silky in appearance; petiolules 1.5–4 mm. long, slender. Inflorescences several, terminal and axillary, 7–35 cm. long, the peduncle 3–8 cm. long, the terminal inflorescence with 1 or 2 branches, leafless, erect, usually lax, many-flowered, the flowering nodes 5–40; buds 5–8 at a node, 3–6 of these flowering, 1 or 2 fruiting. Primary bracts lanceolate or linear-lanceolate, 10 mm. or less long, deciduous; secondary bracts linear-lanceolate or linear, 2–4 mm. long, deciduous. Pedicels ascending, 5–8 mm. long, rusty-strigillose or hirtellous. Dried flowers 20–30 mm. long. Calyx 6–7.5 mm. long, strigillose or hirtellous with rusty hairs, the tube ca. 4 mm. long, the lobes triangular to ovate and short-acuminate, the upper 1–1.5 mm. long, the lateral 3.5–4 mm. long, the lowermost 4 mm. long. Corolla of dried specimens purple to brown; blade of the banner suborbicular, 22–25 mm. high, 20–22 mm. broad, densely golden-strigillose on the back, the claw ca. 3 mm. long; wings ca. 28 mm. long, 6 mm. wide, auricled, the claw 4 mm. long; keel ca. 25–27 mm. long 7–10 mm. deep, auricled, the claw 4 mm. long. Staminal tube 19–21 mm. long, the vexillary stamen free at the base, with a conspicuous callosity on the upper side near the base. Ovary densely strigillose to short-strigose. Legumes nearly straight, somewhat narrowed and curved near the base, spreading, 7–10 cm. long, 5–7 mm. wide, densely hirsutulous with rusty-brown hairs, usually appearing finely velutinous; seeds 13–17, the mature seeds not seen.

Distribution. Presumably in oak woodland, apparently primarily at relatively low altitudes (600–700 m.), Sinaloa and Nayarit, Mexico. Map 18.

Specimens examined. MEXICO. Sinaloa: "Western Mexico", *Seemann* (GH) (probably *Tephrosia leucantha* of Seem. Bot. Voy. Herald. 280. 1856, not HBK., from Cerro de Pinal, Sinaloa, according to Riley, Kew Bull **1923:** 341. 1923); Picachos, Municipalidad Rosario, *Ortega 7139* (CAS, F, MEXU, US); Cordón de las Trompetas, Ixtagua, San Ignacio, 660 m., *Montes & Salazar 489*, 17 Aug. 1918 (US); Falda del C[erro] del

Perico, San Ignacio, 620 m., *Montes & Salazar 539*, 2 Sept. 1918 (US); Cerro del Perico, 620 m., El Limón, San Ignacio, *Ortega 394* (MEXU). NAYARIT: Between Pedro Paulo and San Blascito, *Rose 3336*, 4 Aug. 1897 (GH, MEXU, US; NY-photo); between Aguacata and Dolores, *Rose*, 6 Aug. 1897 (US).

29. **Tephrosia nitens** Benth. ex Seem.

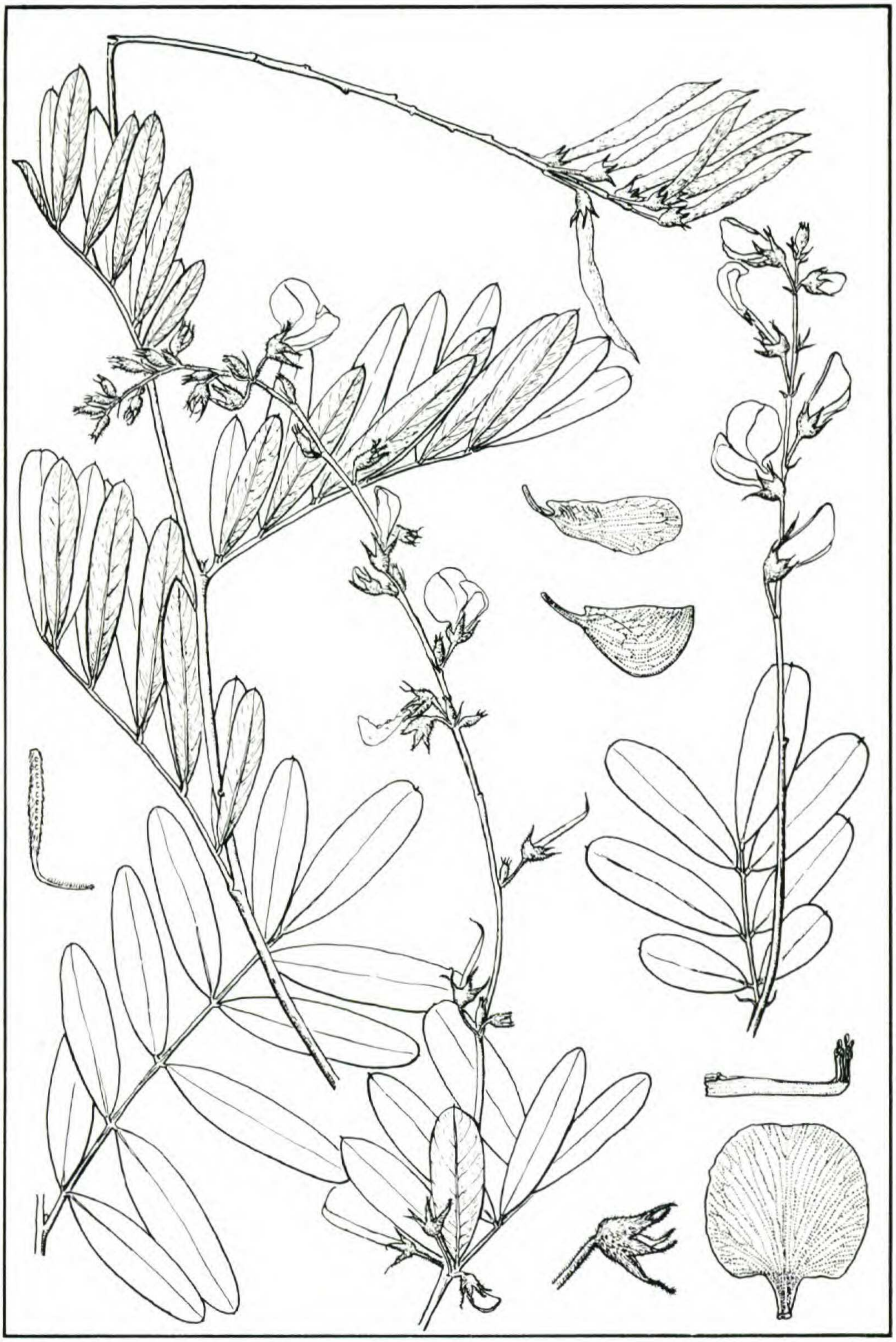
Tephrosia nitens Benth. ex Seem. Bot. Voy. Herald 107. 1853. Island of Taboga, Bay of Panama, Panama, *Seemann* (F-, NY-photograph of *Seemann 1036* at K).

Cracca nitens (Benth. ex Seem.) Kuntze, Rev. Gen. **1:** 175. 1891.

Tephrosia nitens var. *lanata* Micheli in Dur. & Pitt. Bull. Bot. Soc. Belg. **30**(1)**:** 286. 1891. Cotypes collected in Costa Rica, "Terraba," *Pittier 3809*, Feb. 1891 and "savanes de Buenos Aires," *Pittier 3822* (F-fragment of *3809* ex Herb. Berol.; F-, GH-photograph of *3809* in Herb. Berol.; US-2 sheets of *Tonduz 3809*, "savanes des monts de Terraba," Feb. 1891, which may represent the same collection).

Tephrosia albida Brandeg. Univ. Calif. Publ. Bot. **10:** 406. 1924. Rocks along the road from Tuxtla Gutierrez to Jalisco, Chiapas, Mexico, *C. A. Purpus 9136*, Sept. 1923 (UC 220439-Type).

Erect herb from a woody crown, or a sparsely-branched shrub 3 m. high. Stems, petioles, rachises, petiolules and pedicels densely short-strigose to strigose or spreading-hirsute or villous with fine soft cinereous to tawny hairs up to 3 mm. long, appearing somewhat lanate. Leaves 2–15 cm. long, the petiole 2–5 mm. long, the rachis 1–6.5 cm. long, sometimes 2.5 mm. broad, deeply channeled on the upper side; stipules lanceolate to broadly ovate, acuminate, 6–12 mm. long, 2–6 mm. wide, sometimes persistent; leaflets of the principal leaves (1–)5–13, oblong-cuneate to oblanceolate or linear-oblong, rarely somewhat elliptic, the apex rounded, retuse or obtuse, mucronate, the base narrowed, (14–)18–80 mm. long, (5–)7.5–18(–23) mm. wide, 3–7 times as long as broad, the lowermost smallest, the terminal largest; leaflets coriaceous, yellowish-green, glabrous above, silky, densely strigose beneath with shining cinereous to golden hairs or with scattered long spreading hairs along the midrib and veins; veinlets between the main lateral veins running more or less parallel, forming elongate areoles between; petiolules 2–3 mm. long. Inflorescences terminal and axillary, ascending or erect, usually exceeding the leaves, the principal inflorescence terminal, 5–50 cm. long, the peduncle 3–7 cm. long, the uppermost 1–5 leaves sometimes with axillary flowers; axillary inflorescences slender, 5–25 cm. long; flowering nodes 5–ca. 50; buds 5–7 at a node, 4–5 flowering, 1–2 fruiting. Primary bracts lanceolate to ovate, acuminate, 5–13 mm. long, 2–4 mm. wide, deciduous; secondary bracts lanceolate to ovate-lanceolate, acuminate, 4–8 mm. long, deciduous. Pedicels 6–8 mm. long, ascending, ca. 1 mm. in diameter in fruit. Dried flowers 15–20 mm. long. Calyx 6–8 mm. long, densely hairy with appressed to spreading white hairs up to 3 mm. long, the upper lobes deltoid-subulate, 2–5 mm. long, the lateral deltoid-acuminate or lance-subulate,



C. E. W. del.

TEPHROSIA QUERCETORUM, sp. nov. Habit, × ½; details, × 1. (Central flowering plant from *Hernandez & Alexander XA159*-GH; remaining figures from type-collection-GH.)

C. E. W. del.

Tephrosia Abbottiae, sp. nov. Habit, × ½; details, × 1. Interior surface of opened calyx is seen at upper right; hairs on margins of lobes are omitted. (Inflorescence and details from Type-GH; large leaf from *Moore & Wood 4586*-GH.)

4–5 mm. long, the lowermost lanceolate-acuminate, 4–7 mm. long. Corolla rose or white, the banner with a greenish spot at the base; blade of the banner orbicular to subquadrate, 12–17 mm. high, 13–17 mm. wide, densely silky-hairy on the back, the claw 2–3 mm. long; wings oblong, 15–19 mm. long, 4–5 mm. wide, with or without an auricle, the claw 2.5–3 mm. long; keel 14–18 mm. long, slightly or not at all auricled, the claw 3–4 mm. long. Staminal tube 10–15 mm. long, the vexillary stamen coherent with the tube, free at the base, with a prominent thickening on the upper side near the base. Ovary densely strigillose or hirtellous with fine hairs. Legume (3.5–)4–6 cm. long, 4.5–5.5 mm. wide, usually slightly curved downward along its entire length, the tip often contracted evenly into the persistent style-base, legumes strongly ascending, hirtellous to strigillose with very fine white or tawny hairs; seeds 9–13, broadly oval in outline, light brown variegated with black, 3–3.4 mm. long, 2.4–2.8 mm. wide. Somatic chromosomes 22.

DISTRIBUTION. Rocky ground, savannas and pinelands from sea level to 800 m., from Veracruz and Guerrero, Mexico, southward to Honduras, Costa Rica and Taboga Island in the Bay of Panama; Brazil; reported from Venezuela and Colombia. Map 18.

SPECIMENS EXAMINED. MEXICO. GUERRERO: La Botella, 500 m., (Dist. Galeana or Montes de Oca), *Langlassé 670* (GH, US); Plan de Carrizo, Dist. Galeana, 800 m., *Hinton 11037* (GH); Acapulco, *Hinds*, 1842 (GH). OAXACA: *Mell 2279* (NY); Almoloya, 100–250 m., *Williams 9839* (F); Chivela, *Mell 41* (NY, US), *Orcutt 3301* (GH, US). VERACRUZ: Without definite locality, *Orcutt 3301* (F). CHIAPAS: Sabaña Palenque, *Matuda 3758* (A, F, NY); ridge back of Tonala, 1200–2500 ft., *Nelson 2880* (NY, US); road from Tuxtla Gutierrez to Jalisco, *Purpus 9136* (UC).

BRITISH HONDURAS. BELIZE: Near Manatee, *Gentle 3413* (A, MO, NY, US); Baker's Pine Ridge, *Lundell 6995* (F, NY). EL CAYO: Mountain Pine Ridge, *Bartlett 11608* (NY); near Jenkins Creek, north of Monkey River, Toledo Dist., *Gentle 4064* (GH); pine ridge near Manatee Lagoon, *Peck 268* (GH).

GUATEMALA. CHIQUIMULA: Road between Jocotán and Chiquimula, 600 m., *Steyermark 31747* (F).

HONDURAS. CORTÉS: San Pedro Sula, *Thième*, Feb. 1887 (US).

COSTA RICA. CARTAGO: San Rafael, *Pittier 6991* (US). PUNTARENAS: Buenos Aires, Cantón de Osa, 480 m., *Valerio 861* (F); Boruca, *Tonduz 4491* (US); Río Ceiba, 250 m., *Tonduz 4991* (US); monts de Terraba, 260 m., *Tonduz 3809* (US); Terraba, *Pittier*, Feb. 1891 (F-fragment; F-, GH-photo); El General, 700 m., *Pittier 12023* (US). SAN JOSÉ?: El General, 825 m., *Skutch 2471, 2472* (A, MO, NY, US).

PANAMA. PANAMÁ: Taboga Island, Bay of Panama: *Seemann 1036* (F-, NY-photograph); *Standley 27999* (US); 0–250 m., *Pittier 3571* (NY, US); 300 m., *Killip 3174* (US); *Macbride 2830* (F, US); up to 300 m., *Allen 110* (GH, MO); 0–350 m., *Allen 1276* (GH, MO, US).

BRAZIL. Tropical Brazil, *Burchell 9231* (GH).

The two segregates from *Tephrosia nitens* represent normal variations of this well-marked species. The plant described as *T. nitens* var. *lanata* Micheli has 9 or 11 leaflets and blackish, lanate pubescence. The leaflet-number of the typical form of the species varies from 5 to 13, largely with the size of the plant, and the black color of the pubescence seems to be due to the progressive soiling of the long, fine hairs which often twist together late in the season.

Tephrosia albida Brandegee was said to differ in the length of the pedicels and in the "form and color of the corolla, "which, according to Brandegee, is "pallide purpurea," thus hardly contrasting significantly with the "fine rose-colour" described by Bentham. The type-specimen is well within the ordinary range of variation of *T. nitens* which seems to have been otherwise unrepresented in Brandegee's herbarium.

30. **Tephrosia hypoleuca** Riley

Tephrosia hypoleuca Riley, Kew Bull. **1923:** 339. 1923, not *Cracca hypoleuca* (Boiss.) Alef. 1861, or *C. hypoleuca* Rydb. 1923. "Sierra Madre," (Sinaloa, Durango or Nayarit, between the cities of Mazatlán and Durango or Durango and Tepic), Mexico, *Seemann 2192*, Nov. 1849–Feb. 1850 (K-Type).

Erect perennial, the base and roots unknown; stems sulcate, 3 mm. in diameter 3 dm. below the apex, monopodial. Stems, petioles, rachises, petiolules and pedicels densely strigillose to ascending-hirtellous with fine white or somewhat rusty hairs. Leaves 3.5–9.5 cm. long, the petioles 2–15 mm. long, the rachises 0–1.5 cm. long, deeply channeled on the upper side; stipules deciduous or easily broken; leaflets of the principal leaves 3–7, oblanceolate, acute or obtuse, a few slightly retuse, mucronulate, principally 2–7.5 cm. long, (5–)7–19 mm. wide, the terminal leaflet the largest; leaflets coriaceous, strigillose with very fine white hairs above when young, appearing somewhat canescent, becoming glabrous or nearly so and shining; leaflets densely white-strigillose below, dull to silky in appearance, the veins prominent; petiolules 2–4 mm. long. Inflorescences terminal or axillary, 3–9 cm. long, the peduncle 0.5–2 cm. long, the flowering nodes 5–10; buds ca. 5 or 6 at a node, 3–5 flowering. Primary bracts lanceolate, acuminate, 7–13 mm. long, 1.5–2 mm. wide, apparently deciduous, densely hirtellous; secondary bracts linear-lanceolate, up to 10 mm. long. Pedicels 5–11 mm. long, ascending, thickening to 1 mm. in fruit. Dried flowers 25–30 mm. long. Calyx campanulate, 8–9 mm. long, densely strigillose to ascending-hirtellous with fine white or (along the margins) rusty hairs, the upper lobes deltoid-acuminate, ca. 4 mm. long, the lateral and lowermost with deltoid bases, subulate, 6–7 mm. long. Corolla in dried specimen brownish with a tinge of lavender, the banner apparently with a

green spot near the base; banner 33 mm. long, the blade nearly orbicular, 28 mm. wide, emarginate at the apex, tapering into a narrow claw, densely appressed-hirtellous with golden hairs on the back; wings 29 mm. long, 14 mm. wide, the base of the blade truncate, not auricled, the slender claw 4 mm. long; keel scimitar-shaped, 29 mm. long, 11 mm. wide, the apex rounded, the base narrowed into a slender claw ca. 5 mm. long, exauriculate. Staminal tube 20 mm. long, the vexillary stamen apparently coherent with the tube, free at the base, with a prominent 3-lobed knob-like projection on the upper side near the base. Ovary 20 mm. long, appressed-hirtellous, the style 12 mm. long, barbate on the inner side. Legume curving slightly upward, ca. 8 cm. long, 6–7 mm. wide, compressed, densely hirsutulous with antrorsely directed rusty and white hairs, the overall effect rusty; seeds 12–13, the mature seeds unknown.

DISTRIBUTION. Southern Sinaloa and probably adjacent Nayarit, Mexico.

SPECIMENS EXAMINED. MEXICO. SINALOA: Quebrada, Municipalidad Concordia, 1500 m., *M. P. Dehesa 1559*, Sept. 1919 (K, US), *Ortega 287* (MEXU). SINALOA, DURANGO or NAYARIT: Sierra Madre, *Seemann 2192* (K).

Although poorly known, *Tephrosia hypoleuca* is a handsome, distinctive species with 3–7 oblanceolate, coriaceous leaflets, large flowers and deltoid calyx-lobes. It should not be confused with *Cracca hypoleuca* Rydb. (1923), based on *Indigofera Perriniana* Spreng. (1821). The latter plant is a *Tephrosia* of the glabrous-styled series and seems to represent, moreover, only a casual introduction of the African species, **T. linearis* (Willd.) Pers., into the West Indies, where it has not been recollected.

31. **Tephrosia vernicosa** sp. nov.

Planta perennis herbacea vel suffruticosa, 3–5 dm. alta. Folia 4–9 cm. longa; petioli (2–)5–10 mm. longi; stipulae lineari-acuminatae deciduae, 8–10 mm. longae, 1–1.5 mm. latae; foliola foliorum praecipuorum 5–9, angustato-lanceolata, medio latissima, vel leviter oblanceolata, basi et apice acuta, mucronata, foliola superiora folii (23–)35–62 mm. longa, (7–)9–14 mm. lata, inferiora 20–42 mm. longa, 6–10 mm. lata; foliola tenuia firma, supra vernicosa, glabra vel nervus primarius breve strigosus, subtus dense strigillosa pilis cinereis nitidis. Inflorescentiae praecipuae terminales compactae subcapitatae, 2–3 cm. longae, pedunculis 5–7 mm. longis; nodi floriferi circa 6–8, alabastra circa 5 per nodum. Bracteae primariae lineari-lanceolatae, acuminatae, 8–11 mm. longae, 1.5 mm. latae, deciduae. Pedicelli 8 mm. longi, densissime hirsuti vel villosi. Calyx circa 12 mm. longus densissime hirsutus vel villosus pilis cinereis vel ferruginosis; lobi laterales et lobus infimus ovato-deltoidei, abrupte acuminati, attenuati; lobi superiores 6–7 mm. longi, lobi laterales 7–8 mm. longi, lobus infimus 6–7 mm. longus. Lamina vexilli suborbicularis, 15–16 mm. alta lataque, ungue 5 mm. longo; alae 15 mm. longae, 5 mm. latae, leviter auriculatae, ungue 4 mm. longo; carina 13 mm. longa, 8 mm. profunda, auriculata, ungue 4 mm. longo. Tubus staminalis circa 13 mm. longus; stamen vexillare tubo connatum, basi liberum. Ovarium dense strigosum; ovulae 7; stylus barbatus. Legumen seminaque incognita.

Erect herbaceous or suffruticose perennial, 3–5 dm. high, from a woody crown and root; stems terete below, somewhat ridged and sulcate above. Stems, petioles, rachises and axes of inflorescences densely strigillose and with longer ascending cinereous and/or tawny hairs. Leaves 4–9 cm. long, the petioles (2–)5–10 mm. long, much shorter than the lowermost leaflets, the rachis 1–2.5 cm. long; stipules linear, acuminate, deciduous or easily broken, 8–10 mm. long, 1–1.5 mm. wide; leaflets of the principal leaves 5–9, narrowly lanceolate, tapering to both ends or slightly oblanceolate, the base acute or cuneate, usually narrower than the acute apex, mucronate, the upper leaflets (23–)35–62 mm. long, (7–)9–14 mm. wide, (3–)4–5 times as long as broad, the basal pairs 20–42 mm. long, 6–10 mm. wide, 3–4 times as long as broad; leaflets thin but rigid, shining as though varnished, glabrous except the short-strigose impressed midrib, at length glabrate above, densely strigillose below with lustrous cinereous or (along the midrib) rusty hairs; petiolules 1–1.5 mm. long. Inflorescences principally terminal, very compact, almost capitate, 2–3 cm. long, the peduncle 5–7 mm. long, the flowering nodes crowded, probably 6–8, short poorly-developed axillary inflorescences 1–3 cm. long sometimes present in the upper axils; buds ca. 5 at a node, ca. 3 flowering. Primary bracts linear-lanceolate, long-acuminate, 8–11 mm. long, 1.5 mm. wide, deciduous; secondary bracts linear-attenuate, ca. 6–8 mm. long. Pedicels ca. 8 mm. long, ascending. Dried flower 18 mm. long. Pedicels, calyx and bracts very densely hirsute to villous with soft cinereous or (near the ends of the calyx lobes) rusty hairs. Calyx ca. 12 mm. long, the lateral and lowermost lobes deltoid-ovate at the base, abruptly narrowed and long-attenuate, the upper lobes 6–7 mm. long, the lateral and lowermost 7–8 mm. long, ca. 2.5 mm. broad at the base. Corolla color unknown, pinkish-brown in dried specimen; blade of the banner suborbicular, 15–16 mm. high, 15–16 mm. broad, tapering into a claw 5 mm. long, the blade hirsute or villous on the back with fine silky rusty and cinereous hairs, wings ca. 15 mm. long, 5 mm. broad, slightly auriculate, the claw 4 mm. long; keel 13 mm. long, 8 mm. deep, auriculate, the claw 4 mm. long. Staminal tube ca. 13 mm. long, the vexillary stamen coherent with the tube, free at the base, with a prominent 2-lobed callosity on the upper side near the base. Ovary densely strigose, the style barbate, ovules 7. Legume and seeds unknown. Fig. 4, Plate 1153.

Distribution. Known only from the type-locality. Map 16.

Specimens examined. MEXICO. Guerrero: "Shrub, 30 cm., local, pine forest," Laguna–Tequeches, 1950 m., Dist. Mina, *G. B. Hinton 9950*, 3 Dec. 1936 (NY-Type; GH, UC).

Although it is known from only a single collection, *Tephrosia vernicosa* is so completely distinct that it is not likely to be confused with any other American species. The 5–9 lanceolate leaflets tapering to both ends, the upper surfaces shining as though varnished and the lower surfaces densely strigillose, the

much-condensed, congested inflorescences, and the characteristic hirsute or villous calyx with attenuate lobes 6–8 mm. long immediately differentiate it. The legume and seeds are unknown, but the few ovules (7 in the single ovary available for dissection) indicate that additional diagnostic characters may perhaps be found there.

The calyx and congested inflorescences suggest *Tephrosia pogonocalyx*, another new species also known only from a single collection, but the vegetative characters of that plant are quite different. The leaflets in shape and number approach most nearly *T. hypoleuca* of Sinaloa but the resemblance is otherwise not very striking, the flowers being very dissimilar.

The Sierra Madre of Guerrero south of the Río Balsas, from which this new species comes, seems to have been almost untouched except for the collections made by Langlassé, Nelson and Hinton. Nevertheless, eleven species of *Tephrosia* are already known from this area which shares with northern Guerrero, adjacent Morelos and México a total of 17 species, indicating that this region is one of the important centers of diversification of the genus.

32. **Tephrosia pogonocalyx** sp. nov.

Planta perennis erecta herbacea(?), 1 m. alta, undique hirtella vel hirsutula. Folia praecipua 7–13.5 cm. longa; petioli 1–17 mm. longi; stipulae deciduae; foliola foliorum praecipuorum 5–13, elliptica vel angustato-elliptica, basi et apice rotundata vel acuta, 22–43 mm. longa, 11–18 mm. lata, tenuia, supra hirtella vel hirsutula pilis fulvis, subtus hirsutula pilis cinereis, venis conspicuis. Inflorescentia "paniculata," circa 25 cm. longa, nodi floriferi ramorum 3–15, conferti, alabastra circa 4–5 per nodum. Bracteae primariae angustae prope subulatae, attenuatae, 6–11 mm. longae, deciduae; bracteae secundariae lineari-acuminatae, 5–6 mm. longae, deciduae. Pedicelli circa 8 mm. longi, hirsuti vel hirsutuli. Calyx campanulatus 10–12 mm. longus, hirtus vel hirsutulus pilis ferruginosis vel fulvis divaricatis; lobi superiores deltoidei attenuati, 5–7 mm. longi; lobi laterales lanceolati acuminati attenuati, 6–7 mm. longi; lobus infimus 7–9 mm. longus; bracteolae 1 vel 2, lineari-setaceae, circa 5 mm. longae, hirsutae vel hirsutulae. Corolla roseo-purpurea (?); vexillum basi macula viridia, lamina suborbicularis, 15 mm. alta, 16 mm. lata, extus hirsutula; alae 16–17 mm. longae, 6 mm. latae, auriculatae, ungue 3–4 mm. longo; carina 17 mm. longa, ungue 3–4 mm. longo. Tubus staminalis 13–14 mm. longus; stamen vexillare tubo connatum, basi liberum. Ovarium dense strigosum, 9-ovulatum; stylus barbatus. Legumen immaturum hirsutum pilis fulvis.

Erect herbaceous(?) perennial, 1 m. high; stems nearly terete or somewhat angular, striate. Stems, petioles, rachises and axes of inflorescences densely hirtellous to hirsutulous with tawny or cinereous spreading hairs. Principal leaves 7–13.5 cm. long, much reduced in size at the inflorescence,

2–7 cm. long, the petioles 1–17 mm. long, the rachis 3–9.5 cm. long; stipules deciduous; leaflets of the principal leaves 5–13, elliptic or narrowly so, the base and apex either rounded or acute, the apex mucronate, 22–43 mm. long, 11–18 mm. wide, 2–3 times as long as broad, the leaflets of the uppermost leaves (subtending axillary inflorescences) (5–)9–35 mm. long, (2–)5–10 mm. wide, 2–3 times as long as broad; leaflets thin, evenly hirtellous or hirsutulous above with short tawny hairs, moderately hirsutulous below with ascending cinereous hairs, the veins conspicuous on both surfaces; petiolules 1–2 mm. long. Inflorescence "paniculate", composed of a crowded terminal inflorescence with 3–4 short branches 2–3 cm. long from the axils of the upper leaves, the axillary inflorescences reduced in size upward, the longest ca. 13 cm., the flowering portion of the plant ca. 25 cm. long, the flowering nodes 3–15 per branch of the inflorescence, crowded; buds 4–5 at a node. Primary bracts very narrow, almost subulate, attenuate, 6–11 mm. long, deciduous. Pedicels ca. 8 mm. long, ascending. Dried flowers ca. 20 mm. long. Bracts, pedicels, calyx and bracteoles densely hirsute or hirsutulous with spreading rusty or tawny hairs. Calyx campanulate, 10–12 mm. long, with 1 or 2 linear-setaceous bracteoles ca. 5 mm. long at the base or on the pedicel, the upper lobes of the calyx deltoid, attenuate, 5–7 mm. long, the lateral and lowermost lanceolate, long-acuminate, attenuate, 6–7 mm. long and 7–9 mm. long, respectively. Corolla apparently rose-purple with a green spot at the base of the blade of the banner; blade of the banner subquadrate or suborbicular, 15 mm. high, 16 mm. broad, hirsutulous with rusty hairs on the back, with a broad claw 4 mm. long; wings 16–17 mm. long, ca. 6 mm. wide, auriculate, the claw 3–4 mm. long; keel 17 mm. long, 7–8 mm. deep, slightly auriculate, the claw 3–4 mm. long. Staminal tube 13–14 mm. long, the vexillary stamen coherent with the tube, free at the base, with a callosity on the upper side near the base. Ovary densely strigose, the style barbate; ovules 9. Very immature legume hirsute with tawny hairs, the mature legume and seeds unknown. Fig. 3, Plate 1153.

Distribution. Known only from the type-locality. Map 21.

Specimens examined. MEXICO. México: "One meter high," oak woods, Nanchititla, Dist. Temascaltepec, *G. B. Hinton 3101*, 6 Jan. 1933 (GH-Type; NY).

The densely hirsute calyces brought close together in the rather congested inflorescences suggest *Tephrosia vernicosa*, but this plant is abundantly distinct from that species in its 5–13 membranous, elliptic or narrowly elliptic leaflets and in the presence of bracteoles on pedicels or calyces. Although the single collection leaves much to be desired, this species is so clearly marked by calyces, leaflets, deciduous bracts, crowded inflorescences, and bracteoles that I do not hesitate to describe it.

33. **Tephrosia belizensis** Lundell

Tephrosia chrysophylla Mart. & Gal. Bull. Acad. Brux. **10**(2): 49. 1843, not Pursh, 1814. "On trouve cette Tephrosie dans les savanes a malpighiacées de Zacuapan et de Mirador, à 3000 pieds,"[1] Veracruz, Mexico, *H. Galeotti 3326* (F-leaflet of isotype ex Herb. Mus. Paris.).

Tephrosia belizensis Lundell, Bull. Torr. Club. **64:** 550. 1937. Open rocky bank of Río Frio near San Agustin, Mountain Pine Ridge, El Cayo Dist., British Honduras, *C. L. Lundell 6662*, 29 July 1936 (NY, US).

Slender erect herbaceous or suffrutescent perennial 0.4–2 m. high. Stems, petioles, rachises and axes of the inflorescences strigillose to hirtellous with rusty or cinereous hairs, occasionally with scattered longer hairs. Leaves ascending or spreading, principally 8–24 cm. long, sessile or with petioles only 1–3 mm. long, the rachis 3.5–15 cm. long; stipules linear-subulate, 5–6 mm. long, ca. 1 mm. wide, deciduous; leaflets 5–19, the upper pairs lanceolate or ovate-lanceolate, 2–7.5 cm. long, 0.7–2.5 cm. wide, the apex acute, acuminate, blunt or slightly retuse, mucronate, the base obtuse or rounded, the lowermost pair of leaflets much reduced, suborbicular to oval or ovate, 1–2.5 cm. long, 0.8–1.5 cm. broad, the two lowermost pairs of leaflets usually crowded; leaflets glabrous, dark green and shining, estomatiferous above, moderately to densely strigillose to short-strigose beneath with silvery or golden hairs, silky, shining; petiolules (1–)2–4 mm. long, densely strigillose to hirtellous. Principal inflorescences terminal or 1 or 2 from the upper axils, leafless, lax, slender, the terminal 10–30 cm. long, often with 1–5 branches 10–20 cm. long from the axils of bracts, the peduncle 4–9 cm. long, the flowering nodes 5–32; buds 5–7 at a node, 3–5 flowering, 1 or 2 fruiting. Primary bracts linear-lanceolate, 5–10 mm. long, deciduous before anthesis. Pedicels 6–9 mm. long, ascending, thickening in fruit, hirtellous with rusty hairs. Dried flowers 13–17 mm. long. Calyx ca. 5 mm. long, hirtellous to strigillose with rusty hairs, the lobes linear-lanceolate to lanceolate, the upper 2 mm. long, the lateral 3–4 mm. long, the lowermost 4–5 mm. long. Corolla apparently lavender or magenta; blade of the banner suborbicular, ca. 14 mm. broad, densely hairy on the back, the claw ca. 3 mm. long; wings 15–17 mm. long, 5–6 mm. wide, the claw ca. 2.5 mm. long; keel ca. 15 mm. long, 6 mm. deep, slightly auricled at the base and beaked at the distal end, the claw 3.5 mm. long. Staminal tube ca. 14 mm. long, the vexillary stamen connate with the tube, free at the base, somewhat thickened on the upper side near the base. Ovary densely strigillose; ovules 9–10. Legumes straight or slightly curved downward near the base, short-beaked, 5–7 cm. long, 6–7 mm. wide, ascending or spreading, hirtellous or sometimes hirsutulous with rusty hairs; seeds 8–10, 3.6–4.2 mm. long, 2.8–3.2 mm. broad, brown to gray, lightly variegated with black. Somatic chromosomes 22. Flowering collections from February to March.

[1] According to Allen (1945, p. 281) Zacuapán is the modern village of Axouacapán. This seems to be a misspelling of Axocuápam or Axocuapan which lies north of Huatusco and approximately 11 km. west of Mirador.

DISTRIBUTION. Pine and oak forests (20–1000 m.?) from Veracruz to Oaxaca and Chiapas, Mexico, and British Honduras. Map 24.

SPECIMENS EXAMINED. MEXICO. VERACRUZ: Mirador or Zacuapán, *Galeotti 3326* (F-fragment); Zacuapán, *Purpus 16360a*, Mar. 1934 (F); rocky oak forests, Zacuapán, *Purpus 16460*, Apr. 1935 (K); Fortín, *Purpus 8679* (US); Matlaluca, *Liebmann 4650* (part), Jan. 1843 (UC). OAXACA: Shrub in llanos, Chiltepec and vicinity, 20. m., Dist. Tuxtepec, *Martinez-Calderón 386* (A, MEXU, US); shrub up to 3 ft., oak forests near San José Chiltepec, 100 m., 17° 58′ N, 96° 10′ W, *Schultes & Reko 552*, 10 Apr. 1939 (GH). CHIAPAS: Under oaks, below Finca Liquidambar toward Palestina, 3000 ft., *Hernandez X. & Sharp X379*, 8 Nov. 1945 (GH).

BRITISH HONDURAS. EL CAYO: Erect suffrutescent plant, 40–75 cm., open rocky bank of Río Frio, San Agustin, Mountain Pine Ridge, *Lundell 6662*, July–Aug. 1936 (NY, US); edge of ravine, Mountain Pine Ridge, *Bartlett 11588*, 20 Feb. 1931 (US).

34. **Tephrosia mexicana** sp. nov.

Planta perennis erecta herbacea(?), 6 dm. alta. Caules subflexuosi, hirtelli vel strigillosi pilis fulvis vel ferruginosis. Folia (4–)6–11 cm. longa, petioli 3–10 mm. longi; stipulae lineari-subulatae, 7–8 mm. longae, deciduae; foliola 7–13, superiora lanceolata vel oblongo-lanceolata, apice acuta, mucronata, basi rotundata, 35–65 mm. longa, 9–19 mm. lata, terminale maximum; inferiora minima, elliptica vel lanceolato-ovata, 18–32 mm. longa, 8–15 mm. lata; foliola tenuia, venis conspicuis, supra leviter nitida hirtella vel strigillosa, subtus pallidiora, dense strigillosa vel breve strigosa pilis cinereis. Inflorescentiae terminales et axillares, 8–25 cm. longae, graciles laxae ascendentes, pedunculis 4–6 cm. longis; nodi floriferi 10–35, alabastra circa 3–5 per nodum. Bracteae primariae lineari-subulatae angustatae, 5–6 mm. longae, deciduae; bracteae secundariae 3–4 mm. longae, deciduae. Pedicelli 5–7 mm. longi, graciles, hirtelli vel hirsutuli pilis cinereis. Calyx 4–6 mm. longus, hirtellus vel hirsutulus pilis cinereis vel (lobis) ferruginosis quam 1 mm. brevibus; lobi superiores setacei, 1–2 mm. longi; lobi laterales deltoidei vel ovato-deltoidei, abrupte acuminati, 2.5–3.5 mm. longi, basi 2–2.5 mm. lati; lobus infimus deltoideus vel ovato-deltoideus abrupte acuminatus, 3–4 mm. longus. Corolla roseo-purpurea(?); vexillum basi macula viridia, lamina suborbicularis, 12–13 mm. alta et lata, extus strigillosa pilis ferruginosis; alae 15–16 mm. longae, 5 mm. latae, ungue 3–4 mm. longo; carina 14–16 mm. longa, 5–6 mm. profunda, ungue 3–4 mm. longo. Tubus staminalis 12–13 mm. longus; stamen vexillare tubo connatum, basi liberum. Ovarium dense brevique strigosum; ovulae 6–8. Legumen immaturum hirsutulum pilis fulvis.

Erect herbaceous(?) perennial, at least 6 dm. high; stems terete or somewhat angular, striate, somewhat flexuous. Stems, petioles, rachises and axes of inflorescences moderately to densely hirtellous or strigillose with tawny or rusty hairs. Leaves (4–)6–11 cm. long, the petioles 3–10 mm. long, the rachises (1.5–)4–6 cm. long; stipules linear-subulate, very narrow (0.5–0.7 mm.), 7–8 mm. long, deciduous; leaflets 7–13, the distal pairs lanceolate to oblong-lanceolate, the apex usually acute, mucronate, the base rounded, 35–65 mm. long, 9–19 mm. wide, 3.5–4 times as long as broad, the terminal leaflet largest, the proximal pair of leaflets smallest, elliptic or lance-ovate, 18–32 mm. long, 8–15 mm. wide, 2 times as long as

broad; leaflets thin, the veins conspicuous, slightly lustrous, moderately and evenly hirtellous or strigillose above, paler below, moderately to densely strigillose or short-strigose with lustrous cinereous or (along the veins) rusty hairs, silky; petiolules 1.5–2 mm. long. Inflorescences terminal and axillary, often with 1 or 2 branches from the axils of bracts, or the axillary inflorescences occasionally 2 from the axil of a leaf; inflorescences 8–25 cm. long, the branches 2–10 cm. long, slender, wand-like, curving upward, lax, the 10–35 flowering nodes usually well separated, the peduncles 4–6 cm. long; buds 3–5 at a node, 2 or 3 flowering. Primary bracts linear-subulate, narrow, 5–6 mm. long, ca. 0.5–1 mm. wide, deciduous before anthesis, secondary bracts 3–4 mm. long, deciduous. Pedicels 5–7 mm. long, slender. Dried flowers 13–15 mm. long. Calyx and pedicels hirtellous to hirsutulous with cinereous or (on the calyx-lobes) rusty hairs less than 1 mm. long. Calyx 4–6 mm. long, the upper lobes setaceous, 1–2 mm. long, the lateral and lowermost deltoid or deltoid-ovate, abruptly acuminate, 2–2.5 mm. wide at the base, 2.5–3.5 mm. long and 3–4 mm. long, respectively. Flowers apparently rose-purple, the banner with a green spot at the base; blade of the banner suborbicular, 12–13 mm. high and broad, strigillose with rusty hairs on the back, the claw 3 mm. long; wings 15–16 mm. long, 5 mm. broad, the claw 3–4 mm. long; keel 14–16 mm. long, 5–6 mm. deep, the claw 3–4 mm. long. Staminal tube 12–13 mm. long, the vexillary stamen coherent with the tube, free at the base, with a 2-lobed callosity on the upper side near the base. Ovary densely short-strigose or hirsutulous, the style barbate; ovules 6–8. Mature legume and seeds unknown, the very immature fruit hirsutulous with tawny hairs. FIG. 2, PLATE 1153.

DISTRIBUTION. Known only from the type-locality. Map 24.

SPECIMENS EXAMINED. MEXICO. MÉXICO: Oak woods, Cumbre de Tejupilco, 2000 m., Dist. Temascaltepec, *G. B. Hinton 2698*, 24 Nov. 1932 (GH-Type; NY, UC).

Tephrosia mexicana is reminiscent of *T. belizensis*, a plant of Veracruz, Oaxaca, Chiapas and British Honduras. In addition to their apparent isolation from each other on opposite sides of the Central Plateau, the two species differ in a number of morphological particulars outlined in the accompanying table (p. 346).

35. **Tephrosia Langlassei** Micheli

Tephrosia Langlassei Micheli, Mem. Soc. Phys. et Hist. Nat. Genève **34:** 250. pl. 3. 1903. "Plante de 50 cm., fleurs rouge violet," Sierra Madre, 1750 m., Guerrero, Mexico, *E. Langlassé 798*, Jan. 1899 (GH, US). (Apparently collected in the mountains north of and between Coyuquilla and Nuxco, Dist. Galeana; see discussion under *T. major*.)

Cracca Langlassei (Micheli) Rose, Contr. U. S. Nat. Herb. **12:** 270. 1909.

Erect herbaceous or somewhat suffrutescent perennial, 2.5–5 dm. or more high, branching monopodially. Stems petioles, rachises, petiolules

and axes of inflorescences sparsely to densely hirsute or villous with golden or rusty, spreading or somewhat recurving hairs, not doubly pubescent. Principal leaves 6–20 cm. long, sessile or with petioles to 25 mm. long, the rachis 2–11 cm. long; stipules linear-lanceolate to linear, acuminate, 12–13 mm. long, usually persistent, green becoming brown; leaflets of the principal leaves 5–11, lanceolate to ovate-lanceolate, elliptic-lanceolate or oblong-lanceolate, the base rounded, the apex acuminate or occasionally acute, tipped by the slender excurrent midrib, 1.3–8.5 cm. long, 0.8–2 cm.

	T. mexicana	*T. belizensis*
Petioles	3–10 mm. long.	0–3 mm. long.
Leaflets	7–13, the lowermost pair elliptic or lance-ovate, 18–32 mm. long, 8–15 mm. wide, the 2 lowermost pairs not crowded; leaflets hirtellous or hirsutulous above.	5–19, the lowermost pair suborbicular to oval or ovate, 10–25 mm. long, 7–15 mm. wide, the two lowermost pairs crowded; leaflets glabrous above.
Primary bracts	Linear-subulate, 5–6 mm. long.	Linear-lanceolate, 5–10 mm. long.
Calyx	Upper lobes setaceous, 1–2 mm. long, lateral and lowermost lobes deltoid or deltoid ovate, abruptly acuminate, 2.5–3.5 mm. and 3–4 mm. long, respectively.	Lobes linear-lanceolate to lanceolate, 2 mm., 3–4 mm., and 4–5 mm. long, respectively.
Ovules	6–8	9–10

wide, the lowermost leaflets usually smallest; leaflets thin, usually almost membranous, dark green above, paler beneath, the veins evident, the upper epidermis usually stomatiferous, hirsutulous, the lower surface moderately to densely hirsutulous or hirsute with spreading cinereous or golden hairs; petiolules 1–2 mm. long, slender. Inflorescences terminal and axillary (the latter often 2 from an axil), usually lax, slender, ascending, 4–35 cm. long, leafless or the lowermost node with a leaf, the peduncle 2–10 cm. long, the axis angled, sulcate or striate, the flowering nodes 3–20; buds 3–5 at a node, usually 3 flowering. Primary bracts linear-lanceolate or linear, long-acuminate, 7–18 mm. long, usually green, persistent, 5-veined; secondary bracts linear to linear-setaceous, long-acuminate, 6–13 mm. long, often persistent. Pedicels slender, almost filiform, 10–13 mm. long, scarcely thickening in fruit. Dried flowers 13–15 mm. long. Calyx campanulate, 8–9 mm. long, hirtellous with very fine whitish hairs and hirsute or villous with golden or rusty hairs, the lobes deltoid at the base, subulate-attenuate, the upper lobes 5 mm. long, the lateral 5–6 mm. long, the lowermost 7–7.5 mm. long. Corolla pink or purplish when dry, the banner with a green spot at the base; blade of the banner suborbicular, 12–14 mm. high, 12–13 mm. broad, strigillose or short-strigose on the back

with fine silky hairs, the claw 2–3 mm. long; wings 14–15 mm. long, ca. 6 mm. wide, slightly auricled, the claw 3 mm. long; keel 13–15 mm. long, exauriculate, the claw 3–3.5 mm. long. Staminal tube 10–12 mm. long, the vexillary stamen coherent with the tube, free at the base, with a prominent callosity on the upper side. Ovary strigose with fine soft hairs; ovules 6 or 7. Legume 4–5 cm. long, 6–7 mm. broad, flat, hirsutulous to hirsute with spreading golden or rusty hairs, horizontal or ascending; seeds 5–7, the mature seeds not seen. Flowering collections from January to April.

DISTRIBUTION. Rocky slopes and pineland, 1300–1750 m., Veracruz, Guerrero, Oaxaca and Chiapas, Mexico. Map 17.[1]

SPECIMENS EXAMINED. MEXICO. VERACRUZ: Hillsides, Tecomatla, *Purpus 10028*, Apr. 1927 (F); rare, on moist rocks, barrancas near Tecomatla, *Purpus 10106*, 25 Feb. (US); very rare, rocky slopes, barranca near Tecomatla, *Purpus 10508*, Oct. (US); Tecomatla, *Purpus* (US); rocky hillsides near Tecomatla, *Purpus 10528*, Oct (UC); Matlaluca, *Liebmann 4650*, Jan. 1843 (US). OAXACA: Between Juquila and Nopala, Dist. Juquila, 4000–17000 [7000?] ft., *E. Nelson 2419*, 4 Mar. 1895 (US); between Santa Cruz and Teutila, Dist. Cuicatlán, 1300 m., *Conzatti 3550*, 20 Apr. 1919 (US). GUERRERO: Sierra Madre, 1750 m., [apparently Dist. Galeana; see synonymy above], *Langlassé 798*, Jan. 1899 (GH, US). CHIAPAS: Pineland, Montecristo, *Matuda 1975*, Jan. 1938 (A, F, NY, US).

Tephrosia Langlassei is discussed with the following species.

36. **Tephrosia simulans** sp. nov.

Planta *Tephrosiae Langlassei* affinis perennis erecta herbacea vel suffrutescens, 0.2–2.5 m. alta, undique strigillosa, hirtella vel hirsutula pilis aureis vel cinereis quam 1 mm. brevioribus. Folia praecipua 5–13 cm. longa; stipulae lineari-acuminatae vel lineari-setaceae, 5–7 mm. longae, plerumque deciduae; foliola 5–11, lanceolato-ovata, lanceolata, elliptico-lanceolata, oblongo-lanceolata vel fere elliptica, basi rotundata vel obtusa, apice plerumque acuta vel rotundata, longiuscule mucronata, terminale (2.2–)3–7 cm. longum, (0.7–)1–3 cm. latum, inferiora (1–)1.5–5.5 cm. longa, (0.6–)1–2.5 cm. lata, coriacea, venis conspicuis, supra viridia, nitida, estomatifera, hirtella, subtus pallidiora, hirsutula pilis mollibus cinereis vel aliquando aureis. Inflorescentiae terminales vel axillares, 4–30 cm. longae, erectae vel ascendentes, plerumque efoliatae, pedunculis 2–9 cm. longis; nodi floriferi 3–20. Bracteae primariae lineari-lanceolatae vel lineari-subulatae, plerumque brunneae et deciduae; bracteae secundariae lineari-setaceae, 3–5 mm. longae, deciduae. Pedicelli 7–14 mm. longi. Calyx campanulatus 5.5–7 mm. longus, hirtellus vel hirtellus et hirsutulus vel strigillosus et breve strigosus pilis cinereis, ferruginosis vel atro-brunneis, lobi basi deltoidei vel ovato-deltoidei, acuminati vel subulati, lobi superiores 3–4 mm. longi, lobi laterales 3.5–5(–6) mm. longi, lobus infimus 3.5–5.5(–7) mm. longus. Corolla lilacina; vexillum basi macula viridia, lamina suborbicularis, 12–15 mm. alta et lata; alae 13–16 mm. longae, exauriculatae, ungue 2–2.5 mm. longo; carina 14–15 mm. longa, exauriculata, ungue 2–3 mm. longo. Tubus staminalis 10–12 mm. longus; stamen vexillare tubo connatum, basi liberum. Ovarium dense brevique strigosum, 6–7-

[1] Since Map 17 was drawn the westernmost dot for this species (accompanied by "?") has been located more definitely and should be moved southeastward to Dist. Galeana, Guerrero. See synonymy above and discussion under *Tephrosia major*.

ovulatum; stylus barbatus. Legumen fere maturum 4.5–5 cm. longum, 5–5.5 mm. latum, hirsutulum vel hirsutum pilis cinereis, ferruginosis vel atro-brunneis, semina 6–7; semina immatura circa 4 mm. longa, 2.6 mm. lata.

Erect herbaceous or suffrutescent perennial, 0.2–2.5 m. high, from a woody root; stems terete, striate and purplish below, somewhat angled above, branching monopodially. Stems, petioles, rachises, petiolules and axes of the inflorescences strigillose or hirtellous to hirsutulous with golden or cinereous hairs less than 1 mm. long. Principal leaves 5–13 cm. long, sessile or with petioles up to 15 mm. long, the rachis 2–7 cm. long; stipules linear, acuminate, to linear-setaceous, 5–7 mm. long, brown, usually deciduous; leaflets of the principal leaves 5–11, lanceolate-ovate, to lanceolate, elliptic-lanceolate, oblong-lanceolate or nearly elliptic, the base usually rounded or obtuse, the apex acute or rounded, rarely acuminate, tipped by the slender excurrent midrib, the terminal leaflet largest, (2.2–)3–7 cm. long, (0.7–)1–3 cm. wide, the lateral leaflets (1–)1.5–5.5 cm. long, (0.6–)1–2.5 cm. wide; leaflets coriaceous, shining, dark green above, paler below, the veins prominent, often somewhat impressed above, the upper epidermis estomatiferous, hirtellous, the lower surface hirsutulous with soft cinereous or occasionally golden hairs, often appearing pilose; petiolules 1–2 mm. long. Inflorescences terminal and axillary, the latter often 2 from an axil, 4–30 cm. long, ascending, somewhat lax, leafless or 1 or 2 nodes with a leaf, the peduncle 2–9 cm. long, the flowering nodes 3–20; buds 3–5 at a node, 1–3 flowering. Primary bracts linear-lanceolate to linear-subulate, 5–8 mm. long, usually brown and deciduous; secondary bracts linear-setaceous, 3–5 mm. long, deciduous. Pedicels 7–14 mm. long, usually stouter than in *T. Langlassei*. Dried flowers 14–18 mm. long. Calyx campanulate, 5.5–7 mm. long, hirtellous or both hirtellous and hirsutulous or strigillose and short-strigose with whitish, rusty or dark-brown hairs, the lobes deltoid or ovate-deltoid at the base, acuminate to subulate, the upper 3–4 mm. long, the lateral 3.5–5(–6) mm. long, the lowermost 3.5–5.5(–7) mm. long. Corolla "lilac-purple" (Mexia), the banner with a green spot at the base within; blade of the banner nearly orbicular, 12–15 mm. high and broad, strigillose or short-strigose on the back with fine silky hairs, the claw 2.5–3.5 mm. long; wings 13–16 mm. long, 4.5–5.5 mm. wide, scarcely auricled, the claw 2–2.5 mm. long; keel 14–15 mm. long, exauriculate, the claw 2–3 mm. long. Staminal tube 10–12 mm. long, the vexillary stamen coherent with the tube, free at the base, with a prominent callosity on the upper side near the base. Ovary short-strigose with fine hairs, the style barbate; ovules 6–7. Legume nearly straight, 4.5–5.5 cm. long, 5–5.5 mm. wide, hirsutulous to hirsute with whitish, rusty or dark-brown hairs; seeds 6–7, the immature seeds ca. 4 mm. long, 2.6 mm. wide. Flowering collections from January to March.

DISTRIBUTION. At altitudes of 1200–1800 m., mountains in the region of San Sebastián in western Jalisco, and probably Sinaloa, Mexico. Map 17.

SPECIMENS EXAMINED. MEXICO. SINALOA: Sterile material, probably this species: Plants 2–2.5 m. high, in moist, shaded places, Mesa de

Bueso, San Ignacio, 1300 m., *Montes & Salazar 844*, 16 May 1919 (US), *Ortega 482* (MEXU). Jalisco: Brushy slope, near San Sebastián, 3850–5000 ft., *E. W. Nelson 4074*, 16–19 Mar. 1897 (NY, US), *4082* (NY, US); roadside between San Sebastián and the summit of the mountain known as the Bufa de Mascota, 5000–6000 ft., *Nelson 4097*, 20 Mar. 1897 (NY, US); erect, 1.5 m., thicket near stream, Arroyo Seco, s.w. of San Sebastián, 1500 m., *Mexia 1485*, 15 Jan. 1927 (UC); suffrutescent, erect, on steep, pine-forested hillside, east of Arroyo Santa Gertrudis, San Sebastián, 1500 m., *Ynes Mexia 1520–a*, 18 Jan. 1927 (US 1319581-Type; CAS, DS, GH, MO, NY, UC); herb, streamside, Segundo Arroyo, San Sebastián, Sierra Madre, 1500 m., *Mexia 1552–a*, 22 Jan. 1927 (CAS, GH, MO, NY, UC, US).

Tephrosia simulans is undoubtedly closely related to *T. Langlassei*, with which all of these specimens have been identified, but differs from that species in a number of particulars, the most immediately conspicuous of which is the shorter pubescence of all parts except the legume. *Tephrosia Langlassei* is hirsute or villous in varying degrees with golden or rusty, spreading or somewhat recurving hairs, while *T. simulans* is strigillose or hirtellous to hirsutulous with cinereous, golden, or brown hairs usually less than one millimeter long. The more lustrous, thin but rigid and somewhat coriaceous leaflets which are usually merely acute, instead of acuminate as are the membranous leaflets of *T. Langlassei*, and the lack of stomata in the upper epidermis are additional identifying marks of *T. simulans*. The primary bracts of the new species are generally deciduous and much shorter than the persistent bracts of *T. Langlassei* and the calyx-lobes are somewhat broader, usually shorter, less attenuate, and considerably more variable, at times suggesting those of *T. crassifolia*. Completely mature pods have not been seen, but the material available indicates that those of *T. simulans* are about a millimeter narrower than the legume of *T. Langlassei*. Although in many species pubescence-characters have proved too variable to be of much taxonomic value, in this instance the shorter trichomes of *T. simulans* appear to be a trustworthy point of recognition. Additional field-study of both species is, nevertheless, highly desirable.

37. **Tephrosia quercetorum** sp. nov.

Planta perennis decumbens vel erecta herbacea, 3–6 dm. alta. Folia 7–13 foliolata; foliola oblonga, oblongo-oblanceolata vel lineari-oblonga, raro oblongo-obovata, basi plerumque acuta vel cuneata, apice rotundata vel acuta, mucronata, 17–58(–62) mm. longa, 6–14(–18) mm. lata, tenuia, supra viridia,

nitida, venis conspicuis, glabra vel nervus primarius strigillosus, subtus pallidiora, substrigillosa pilis albidis. Inflorescentiae terminales 6–27 cm. longae, erectae, plerumque efoliatae, pedunculis 2–5 cm. longis, nodi floriferi 4–17. Bracteae primariae lineari-lanceolatae vel lineares, deciduae. Pedicelli 5–13 mm. longi. Calyx 8–12 mm. longus, hirtellus et hirsutulus vel strigillosus vel strigillosus et breve strigosus pilis cinereis, ferruginosis et atrobrunneis; lobi superiores 4–6 mm. longi, lobi laterales 5–8 mm. longi, lobus infimus 6–9 mm. longus. Corolla roseo-purpurea; vexillum basi macula viridia, lamina 16–19 mm. longa, 14–19 mm. lata, extus strigillosa pilis albidis; alae 16–19 mm. longae, auriculatae; carina 16–18 mm. longa, ungue 4–5 mm. longo. Tubus staminalis 12–15 mm. longus; stamen vexillare tubo connatum, basi liberum. Ovarium dense brevique strigosum; stylus barbatus; ovulae circa 9–10. Legumen immaturum circa 4–4.5 mm. latum, hirsutulum pilis cinereis, ferruginosis et atrobrunneis.

Decumbent or erect herbaceous perennial 3–6 dm. high from heavy woody roots and a slender branching crown, the stems several, simple or branched, nearly terete below, striate, angular and sulcate above. Stems, petioles, rachises, petiolules and axes of inflorescences strigillose to short-strigose, or the inflorescences somewhat hirsutulous with cinereous, rusty or dark-brown hairs. Leaves ascending, (4.5–)7–13 cm. long, the petioles 3–16 mm. long, much shorter than the lowermost leaflets, the rachis (2–) 3–7.5 cm. long, both petiole and rachis channeled on the upper side; stipules linear, acuminate, 5–12 mm. long, brown, persistent at least until anthesis; leaflets of the principal leaves (5–)7–13, oblong, oblong-oblanceolate, or linear-oblong, occasionally oblong-obovate, the base generally acute or cuneate, the apex rounded to acute, mucronate, 17–58(–62) mm. long, 6–14(–18) mm. wide, thin but firm, the lateral veins prominent and conspicuously reticulate between, the leaflets bright green, lustrous, glabrous or strigillose along the midrib above, pale below, moderately strigillose to short-strigose with fine whitish hairs, sometimes appearing silvery or canescent; petiolules 1.5–2.5 mm. long. Inflorescences terminal, 6–27 cm. long, ascending or erect, leafless or the lowermost node with a leaf, exceeding the leaves, the axis angular and sulcate, the peduncle 2–5 cm. long, the flowering nodes 4–17; buds 4–6 at a node, 2–4 flowering. Primary bracts linear-lanceolate to linear, long-acuminate, 6–8 mm. long, 1 mm. or less wide, deciduous, brown; secondary bracts linear-filiform, 4–7 mm. long, deciduous. Pedicels 5–13 mm. long, ascending. Dried flowers 18–21 mm. long. Calyx 8–12 mm. long, hirtellous and hirsutulous to strigillose or strigillose and short-strigose with various combinations of cinereous, rusty, and dark-brown hairs, the lobes lanceolate to lance-ovate, long-acuminate, the upper lobes 4–6 mm. long, the lateral 5–8 mm. long, the lowermost 6–9 mm. long. Corolla rose-purple, becoming violet in age, the banner with a conspicuous green spot near the base; blade of the banner suborbicular, 16–19 mm. high, 14–19 mm. wide, strigillose on the back with fine white hairs, the claw 3–4 mm. long; wings 16–19 mm. long, 4.5–5 mm. broad, with an acute auricle, the claw 2.5–4.5 mm. long; keel 13–18 mm. long, 7 mm. deep, the claw 4–5 mm. long. Staminal tube 12–15 mm. long, the vexillary stamen coherent with the tube, free at the base, with a prominent callosity on the upper side near the base. Ovary

densely short-strigose, the style barbate; ovules ca. 9 or 10. Immature legume 4.5 cm. long, 4–4.5 mm. wide, hirsutulous with cinereous, rusty, and dark-brown hairs. PLATE 1154.

DISTRIBUTION. Known only from the mountains in the region of Taxco, Guerrero, Mexico. Map 21.

SPECIMENS EXAMINED. MEXICO. GUERRERO: Oak woods, Chacualco Trail, Taxco, *Ruth Q. Abbott 333*, 12 Aug. 1937 (GH); steep, rocky, acid slopes with huge exposed boulders and ledges in oak woods, Huajutla, near km. 151–153 on highway above Taxco, ca. 6000 ft. (1800–1900 m.), *H. E. Moore, Jr. & C. E. Wood, Jr. 4547*, 16 Aug. 1948 (GH-Type; MEXU, UC, Bailey Hortorium); north of Iguala, *E. Hernandez X. & E. J. Alexander XA159*, 12 Aug. 1945 (GH, MEXU).

Tephrosia quercetorum is a handsome plant of well-drained rocky soils in oak woods in the neighborhood of Taxco, Guerrero, Mexico. The usually decumbent habit, the 7–13 thin, lustrous, oblong, oblong-oblanceolate or linear-oblong leaflets with the undersurfaces pale and white-strigillose or short-strigose are distinctive, as are the lanceolate to lance-ovate, long-acuminate calyx-lobes. The calyx is strongly reminiscent of *T. Pringlei* and *T. Watsoniana* and the vegetative characters perhaps approach those of *T. Watsoniana* as closely as any other species. The affinities of *T. quercetorum* are not, however, obvious. The presence of dark-brown hairs in addition to the usual rusty or cinereous pubescence normally encountered in many species is remarkable, but is not a constant feature.

38. **Tephrosia Watsoniana** (Standl.) Macbr.

Clitoria? sericea S. Wats. Proc. Amer. Acad. **22:** 407. 1887. On grassy hillsides, Río Blanco [ca. 10 mi. north by west of Guadalajara], Jalisco, Mexico, *Edward Palmer 321*, Aug. 1886 (GH-Type; MEXU, NY).

Cracca sericea (S. Wats.) Rose, Contr. U. S. Nat. Herb. **12:** 271. 1909, not A. Gray, 1883.

Cracca Watsoniana Standl. Contr. U. S. Nat. Herb. **23:** 472. 1922. Substitute name based on *Clitoria? sericea* S. Wats.

Tephrosia Watsoniana (Standl.) Macbr. Field Mus. Publ. Bot. **4:** 87. 1925, not. *T. sericea* (Thunb.) Pers. 1807, or *T. sericea* Bak. in Oliver, 1871.

Erect or somewhat decumbent perennial, somewhat suffruticose at the base, 1–4 dm. high, from a woody branched crown and heavy woody root; stems clustered, sulcate, angled above, nearly terete below. Stems, petioles, rachises and axes of the inflorescences hirtellous and hirsutulous to strigillose or short-strigose with fine cinereous hairs. Leaves unifoliolate or, on large plants, 1–7-foliolate, principally 3–12 cm. long, the rachis when present 0.7–3 cm. long; stipules linear, acute, to linear-subulate,

5–12 mm. long, 1–1.5 mm. or less wide, brown and persistent; leaflets linear-oblong to oblanceolate, oval or obovate, 20–80 mm. long, 9–30 mm. wide, obtuse or rounded at the apex, mucronate, obtuse or rounded at the base, somewhat rigid but thin, green, moderately to densely covered with very fine appressed or ascending hairs above and soft to the touch, appearing canescent, and often glabrate in age; leaflets densely short-strigose or somewhat hirsutulous and silvery below with fine hairs, sericeous and soft, the veins prominent, conspicuously reticulate between the principal laterals; petiolules 1–4 mm. long. Inflorescences terminal, erect, leafless (or the lowermost node with a leaf), few-flowered, 5–24 cm. long, the peduncle 2–10 cm. long, the flowering nodes 2–11; buds 4–5 at a node, 1–3 flowering, 1 or 2 fruiting. Primary bracts linear-lanceolate to subulate, 5–10 mm. long, 1.5 mm. or less wide, brown, persistent; secondary bracts subulate, 3–5 mm. long. Pedicels 5–12 mm. long, slender, ascending. Dried flowers 15–20 mm. long. Calyx 6.5–9.5 mm. long, hirtellous and hirsutulous to strigillose and short-strigose with cinereous and/or rusty hairs, the lobes narrowly triangular and short- or long-acuminate, to subulate-attenuate, the upper lobes 2.5–6 mm. long, the lateral 4–7 mm. long, the lowermost 4–7.5 mm. long. Corolla probably rose-purple, with a green spot at the base of the banner, but purple or violet in dried specimens; blade of the banner nearly orbicular, 13–18 mm. high and broad, densely strigillose on the back, the claw ca. 3.5 mm. long; wings 14–16 mm. long, 5–6 mm. wide, auricled, the claw ca. 3 mm. long; keel 15–17.5 mm. long, 6.5–8 mm. deep, the claw 2.5–3.5 mm. long. Staminal tube 10–12 mm. long, the vexillary stamen coherent with the tube, free at the base, thickened on the upper side near the base. Ovary densely strigillose. Legumes spreading or ascending, 3–5 cm. long, 5–5.5 mm. wide, hirtellous to strigillose with cinereous and/or rusty hairs; seeds 6–7, the mature seeds not seen.

Distribution. Open hillsides, oak and pine woods, 1500–2100 m., Nayarit, Jalisco, and western Guerrero, Mexico. Map 21.

Specimens examined. MEXICO. Nayarit: In the Sierra Madre near Santa Teresa, *Rose*, 10 Aug. 1897 (US); Sierra Madre between Santa Gertrudis and Santa Teresa, *Rose 2110*, 8 Aug. 1897 (GH, NY, US). Jalisco: Grassy hillsides, Río Blanco, *Palmer 321*, Aug. 1886 (GH, NY); near Guadalajara, *Rose & Painter 7477*, 30 Sept. 1903 (US); granitic hills near Guadalajara, 5500 ft., *Pringle 9736*, 10 July 1902 (GH, NY, US); rocky hills near Guadalajara, *Pringle 4449*, June–July 1895 (GH, NY, US); rocky mountain slopes with open oak woods, vicinity of Arenal on highway from Guadalajara to Tequila, 5300 ft., *Moore & Wood 4835*, 31 Aug. 1948 (GH, UC, Bailey Hortorium). Guerrero: Between Ayusinapa and Petatlán, 5000–7000 ft., *Nelson 2130*, 14 Dec. 1894 (US).

This attractive species is one of three Tephrosias in which the leaves are normally unifoliolate, although on large plants of this species some leaves may be 3- or even 7-foliolate. The unifolio-

late condition presumably has been derived independently in all three instances, for the other two species, *T. platyphylla* and *T. madrensis*, are not closely related either to *T. Watsoniana* or to each other.

39. **Tephrosia crassifolia** Benth.

Tephrosia crassifolia Benth. Bot. Voy. Sulph. 80. 1844. Acapulco, Guerrero, Mexico, *Hinds*, 1842 (K-Type).

Cracca crassifolia (Benth.) Kuntze, Rev. Gen. **1:** 174. 1891.

Cracca axillaris M. E. Jones, Contr. West. Bot. **15:** 137. 1929. "Among the live oaks," El Tigre Mine, Acaponeta, Nayarit, Mexico, *M. E. Jones 23022*, 1 Mar. 1927 (POM-Type; F, GH, UC, US).

Tephrosia lanata var. *velutina* (Rydb.) Macbr. Field Mus. Publ. Bot. **4:** 87. 1925, probably as to plant, not as to name. Based on *Cracca velutina* Rydb. (= *T. pachypoda* Riley) of which the type-collection (*Lamb 575*, Zopilote, Nayarit) is a mixture of *T. pachypoda* and *T. crassifolia*. See Morton, Contr. U. S. Nat. Herb. **29:** 101. 1945.

Cracca lanata Mart. & Gal. sensu Rydb. N. Amer. Fl. **24:** 171. 1923, as to material from Sinaloa and Guerrero, Mexico.

Erect or sprawling herbaceous or shrubby perennial 1–2 m. high. Stems, petioles, rachises, petiolules and axes of inflorescences moderately to densely hirtellous or hirtellous and hirsutulous with spreading rusty hairs, the inflorescence sometimes strigillose. Leaves spreading, (5–)8–17 cm. long, the petioles 5–26 mm. long, shorter than the lowermost leaflets of a leaf, the rachis 2–7 cm. long; stipules linear-acuminate, ca. 8 mm. long, 1.5 mm. wide, deciduous; leaflets of the principal leaves 5–9, the terminal leaflet largest, 4.5–7 cm. long, 2–4 cm. wide, elliptic, elliptic-obovate or somewhat rhombic, the lowermost leaflets smallest, 1.5–4 cm. long, 1.2–2.7 cm. wide, oval to ovate or elliptic, the base of the leaflets obtuse, somewhat cuneate or rounded, occasionally subcordate, the apex obtuse or rounded, occasionally retuse, with a short mucro; leaflets coriaceous, overlapping each other, dark green above, the margins wavy, the veins impressed, the surface evenly hirtellous with fine tawny hairs 0.4–0.6 mm. long, or with additional scattered hairs 1 mm. long, soft to touch, glabrate in age, lustrous; leaflets hirtellous beneath with tawny or rusty hairs, especially along the veins, velutinous, soft, the veins conspicuous, reticulate between the principal lateral veins; petiolules 2–4 mm. long. Inflorescences axillary, solitary or with 1 or 2 shorter inflorescences or subdigitate with 1 or 2 branches near the base, slender, ascending, spreading or recurving, 4–15 (–20) cm. long, the peduncle 1–5(–10) cm. long; flowering nodes 5–ca. 25, evenly distributed, not crowded in appearance; buds 5–7 at a node, 3–5 flowering, 1 or 2 fruiting. Primary bracts linear, acuminate, often recurving, 4–6 mm. long, 1 mm. or less wide, deciduous; secondary bracts inconspicuous, 1–3 mm. long, deciduous. Pedicels slender, 4–9 mm. long, spreading or ascending, hirtellous or strigillose. Dried flowers 12–15 mm. long. Calyx cup-like, 4–5 mm. long, hirtellous or strigillose

with rusty (and sometimes cinereous) hairs, occasionally with scattered longer hairs, the tube ca. 3 mm. long, the lobes deltoid, abruptly subulate, the upper lobes 1–2 mm. long, the lateral 1.5–3 mm. long, the lowermost 2–3.5 mm. long. Corolla purple in dried specimens, the banner with a green spot at the base within, densely strigillose with golden hairs without; blade of the banner suborbicular, 11–14 mm. high and wide, the apex retuse, the claw 2–2.5 mm. long; wings 13–15 mm. long, 4–6 mm. wide, slightly or not auricled, the claw 2–2.5 mm. long; keel 13–15 mm. long, slightly or not auricled, the claw 3–3.5 mm. long. Staminal tube 10–11 mm. long, the vexillary stamen coherent with the tube, free at the base, with a conspicuous 2-lobed callosity on the upper side near the base. Ovary densely strigillose. Mature legume not seen, the immature legume nearly straight, resembling that of *T. lanata* in shape, 3–3.5 cm. long, 4–5 mm. wide, hirtellous to hirsutulous with rusty (and sometimes cinereous) hairs, velvety in appearance; seeds 5–7, the mature seeds not seen.

DISTRIBUTION. Western slopes of the Sierra Madre Occidental, 700–1500 m., from Sinaloa to Guerrero, Mexico. Map 23.[1]

SPECIMENS EXAMINED. MEXICO. SINALOA: Deep, rocky, shady canyon with *otate* and palms, oak forest, 3000 ft., Capadero, Sierra Tacuichamona, *Gentry 5571*, 12 Feb. 1940 (GH) (for exact location, see Gentry 1946a). NAYARIT: Zopilote [Zopelote on label of specimen], 2000–3000 ft., *Lamb 575* (part), Feb. 1895 (A, GH, US); among the live oaks, Tiger Mine, Acaponeta, *M. E. Jones 23022*, 1 Mar. 1927 (F, GH, US, UC). JALISCO: Streamside, Hacienda del Otal, San Sebastián, Sierra Madre Occidental, 1500 m., *Mexia 1693-a*, 15 Feb. 1927 (US). GUERRERO: Acapulco, *Hinds*, 1842 (K); Sierra Madre, 1400 m., (apparently from the Sierra Madre between and north of Nuxco and San Luis or Coyuquilla, Dist. Galeana; see discussion, *T. major*), *Langlassé 851*, Feb. 1899 (K).

The lax, often spreading, uncrowded inflorescences, the distinctive calyx and shorter pubescence set *Tephrosia crassifolia* apart from *T. lanata* which it resembles in habit, in number, texture, and often shape of leaflets, and in axillary inflorescences. *Tephrosia crassifolia* appears to be a species of the western Sierra Madre from Sinaloa to Guerrero, while the range of *T. lanata* extends along the slopes of the eastern Sierra Madre from Veracruz into Guatemala and Honduras. This geographical break may possibly prove to be less distinct, however, than would appear from the specimens now in herbaria, for during the summer of 1948 sterile plants of a *Tephrosia* 2–3 feet high with 5–9 lustrous, coriaceous leaflets and abundant pubescence were collected on steep grassy slopes with open pine woods and scattered oaks at

[1] Since Map 23 was reproduced the Guerreran locality accompanied by "?" has been determined more definitely and should be moved southeastward to Dist. Galeana, Guerrero.

an altitude of about 3300 feet between Acahuizotla and Agua de Obispo at km. 339–340 on the highway to Acapulco, Guerrero (*Moore & Wood 4693*, GH, UC, Bailey Hortorium). These plants appear to be identical vegetatively with *T. lanata* from Veracruz and may represent that species, in which event this will be another of those plants which cross over from east to west south of the Central Plateau of Mexico.

It is with some misgivings that the name *Tephrosia crassifolia* Benth. is retrieved from the synonymy of *T. lanata* Mart. & Gal. and adopted as the name for the western member of this pair of species. The type-specimen, collected at "Acapulco", Guerrero, in 1842 (probably from some distance inland where pine forests occur), leaves much to be desired. It consists of two branches with numerous inflorescences, one branch bearing very young buds and the other an immature fruit. A second immature fruit is contained in a pocket on the sheet. No flowers are present, although a few calyces remain. As to vegetative characters, this collection resembles *T. lanata* more strongly than it does specimens from western Mexico. The inflorescences and distinctive calyces link this plant with others from the west, however, so that it would appear proper to include it with those from Jalisco and farther north. Unfortunately, the legumes give no additional information here and, although attempts were made to uncover differences in the leaflet-venation and epidermal structure which might make possible the certain identification of sterile specimens, these met with no success.

Should it eventually be proved that the name *Tephrosia crassifolia* is based upon an aberrant specimen of *T. lanata*, a new combination must be based upon *Cracca axillaris* M. E. Jones, which is without doubt quite distinct morphologically and geographically from *T. lanata*. In view of the few specimens now available, of our scanty knowledge concerning large areas of Mexico, and of our consequent lack of good distributional information, it appears better to resurrect *Tephrosia crassifolia* than to perpetrate another new combination.

40. **Tephrosia lanata** Mart. & Gal.

Tephrosia lanata Mart. & Gal. Bull. Acad. Brux. **10**(2): 48. 1843. "Habite les savanes à malpighiacées de Zacuapan, à 3,000 pieds," (appar-

ently the modern town of Axocuapan or Axocuápam, north of Huatusco; see Sp. 33), Veracruz, Mexico, *H. Galeotti 3286*, August.

Cracca lanata (Mart. & Gal.) Kuntze, Rev. Gen. **1:** 175. 1891.

Erect herbaceous to shrubby perennial about 1 m. high, branching monopodially. Stems, petioles, rachises, petiolules, pedicels and calyces densely hirsutulous with grayish to rusty spreading hairs, appearing pilose, the axes of the inflorescences often less densely so. Principal leaves spreading, 7–17 cm. long, the petioles 5–23 mm. long, much shorter than the lowermost leaflets, the rachis 1.1–6 cm. long; stipules lanceolate-deltoid, acuminate, 6–10 mm. long, 2.5–3 mm. wide at the base, persistent but often broken, densely hairy; leaflets of the principal leaves 5–9, the terminal leaflet largest, 3–13 cm. long, 1.5–6 cm. wide, usually elliptic to oblong-elliptic or oblong-ovate, the lowermost leaflets smallest, 1.2–6 cm. long, 0.9–2.8 cm. wide, elliptic to broadly oval or ovate, the base of the leaflets rounded, often subcordate, the apex slightly retuse, rounded or obtuse, with a small hairy mucro ca. 1 mm. long; leaflets coriaceous, the veins somewhat impressed above, hirsutulous with fine tawny hairs, especially along the midrib, often glabrate, lustrous, densely hirsutulous below, especially along the veins, with fine spreading cinereous to tawny hairs, appearing woolly, soft to the touch, the veins prominent, reticulate between the principal laterals; petiolules 1–3 mm. long. Inflorescences axillary, terminating naked or leafy branches, 3–22 cm. long, slender, ascending, shorter or longer than the leaves, sometimes with 1 or 2 branches from the axils of bracts, or with 1 or 2 shorter inflorescences from the same axil, the peduncles 1–10 cm. long, the flowering nodes 5–25, usually crowded; buds 3–5 at a node, 2 or 3 of these flowering, 1 or 2 fruiting. Primary bracts linear-lanceolate (rarely lanceolate), acuminate, 5–10 mm. long, 1–1.5(–2) mm. wide, sometimes persisting but usually deciduous, glabrous within; secondary bracts linear, acuminate, 4–6 mm. long, 0.5–1 mm. wide. Pedicels slender, ascending, 5–10 mm. long. Dried flowers 13–15 mm. long. Calyx 6–9 mm. long, densely hirsutulous, the tube 2.5–3 mm. long, the upper lobes subulate, 3.5–4 mm. long, the lateral and lowermost lobes lance-subulate, attenuate, 4.5–6 mm. and 5.5–7 mm. long, respectively. Corolla rose-purple; blade of the banner sub-orbicular, 12–15 mm. high, 12–14 mm. broad, densely covered with tawny hairs on the back, the claw 2–3 mm. long; wings 13–16 mm. long, 3–5.5 mm. wide, slightly auricled, the claw 2.5–3 mm. long; keel 13–15 mm. long, exauriculate, the claw 3–3.5 mm. long. Staminal tube 10–11 mm. long, the vexillary stamen coherent with the staminal tube, free at the base, with a conspicuous callosity on the upper side near the base. Ovary densely strigillose. Legumes nearly straight, (2.5–)3–4.5 cm. long, 5–6 mm. wide, somewhat rounded at the distal end, short-beaked on the upper side, spreading or ascending, densely hirsutulous with spreading rusty or cinereous hairs up to 1.5 mm. long, pilose; seeds 3–8, oval-reniform in outline, somewhat compressed, 3.6–3.8 mm. long, 2.4–2.8 mm. wide, brown variegated with black. Flowering collections from August to March.

DISTRIBUTION. MEXICO. VERACRUZ: Zacuapán, *Purpus 2230*,

Nov. 1906 (GH, MO, NY, UC, US); open forests and plains, Zacuapán, *Purpus 10822*, Oct. 1926 (US); rocky oak forests, Rancho Viejo, *Purpus 10822*, Feb. 1933 or Mar. 1934 (DS, US), *14314*, Apr. 1930 or Mar. 1932 (A, F, UC), *16692*, Mar. 1936 (US), *14004*, Feb. 1931 (F); Mirador, *Liebmann 4647*, Oct. or Nov. 1841 (F); Mirador, 3600–3800 ft., *Sartorius* (US).

GUATEMALA. CHIQUIMULA: Pine forest, Socorro Mt., between Finca San José (1.5 mi. s.e. of Concepción de las Minas) and Montaña Nube (Montaña Volcancitos), 1200–1700 m., *Steyermark 30969*, 1 Nov. 1939 (F). JALAPA: Montaña Durazno, 2 mi. east of San Pedro Pinula, 1400–1900 m., *Steyermark 32997*, 10 Dec. 1939 (A, F). ZACAPA: Oak-pine woods along upper reaches of Río Sitio Nuevo, between Santa Rosalía and first waterfall, 1200–1500 m., *Steyermark 42283*, 9 Jan. 1942 (F).

HONDURAS. CORTÉS: San Pedro Sula, 800 ft., *Thième*, Nov. 1888 (J. D. Smith's Dist. No. 5202) (K, US).

Tephrosia lanata and the preceding species, *T. crassifolia*, appear to be a closely related pair, the one extending from Veracruz to Guatemala and Honduras, the other from Sinaloa to Guerrero. Both are little-branched, suffrutescent plants somewhat woody at the base, with 5–9 large, coriaceous leaflets and axillary inflorescences with the lowermost inflorescences first and best developed. The two species differ in several particulars, of which the features of the calyx are most striking. The calyx of *T. lanata* is 6–9 mm. long, densely hirsutulous, with the lateral lobes lance-subulate, attenuate, and 4.5–6 mm. long, while that of *T. crassifolia* is 4–5 mm. long, hirtellous or strigillose, with the lobes deltoid, abruptly subulate, the lateral lobes only 1.5–3 mm. long.

41. **Tephrosia Abbottiae** sp. nov.

Planta perennis erecta gracilis herbacea vel fruticosa, 3–20 dm. alta, undique dense hirsutula vel aliquantum tomentosa pilis mollibus cinereis vel fulvis. Folia praecipua 9–18 cm. longa; petioli 5–20 mm. longi; stipulae ovatae vel lineari-lanceolatae, 9–15 mm. longae, 3–5 mm. latae, deciduae; foliola foliorum 7–11, angustato-elliptica, oblonga vel oblongo-lanceolata, basi rotundata, apice obtusa, mucronata, foliola superiora folii grandissima, (30–)40–73 mm. longa, (11–)15–22(–24) mm. lata, inferiora saepe elliptica, (17–)27–40 mm. longa, (10–)15–19 mm. lata, firma, aliquantum coriacea, supra hirtella vel hirsutula pilis fulvis, subtus dense hirsutula vel tomentosa pilis cinereis. Inflorescentiae terminales et axillares laxae erectae vel ascendentes, 7–30 cm. longae, pedunculis 5–13 cm. longis; nodi floriferi 3–11, alabastra circa 3–5 per nodum. Bracteae primariae lanceolatae vel lanceolato-ovatae, acuminatae, dense villosae, 16–17 mm. longae, 4 mm. latae, deciduae; bracteae secundariae dense villosae, 12–16 mm. longae, deciduae. Pedicelli 10–20 mm. longae, dense villosae. Calyx campanulatus, 14–16 mm. longus, densissime villosus pilis cinereis vel (lobis) ferruginosis; lobi superiores 3–8 mm. longi; lobi laterales lanceolati acuminati, 10–12 mm. longi; lobus infimus lanceolatus vel lanceolato-ovatus, acuminatus, 11–13 mm. longus; bracteolae 2, lineari-lanceolatae, villosae, deciduae, 5–10 mm. longae. Corolla roseo-purpurea; vexillum basi macula viridia, lamina subquadrata vel suborbicularis, 24–27 mm. alta et lata,

extus hirsutula, ungue 8–10 mm. longo; alae 30–34 mm. longae, 10–11 mm. latae, exauriculatae, ungue 8 mm. longo; carina 32–34 mm. longa, 12–14 mm. profunda, exauriculata, ungue 8 mm. longo. Tubus staminalis 25–27 mm. longus; stamen vexillare tubo connatum. Ovarium dense hirsutum vel villosum pilis ascendentibus, 11–13-ovulatum; stylus barbatus. Legumen lineare, 7–19 cm. longum, 6–7 mm. latum, densissime villosum pilis mollibus avellaneis vel fulvis; semina 9–10(–13?).

Erect herb or slender little-branched shrub, 3–20 dm. high; stems nearly terete below, angled and somewhat sulcate above. Stems, petioles, rachises and axes of inflorescences densely hirsutulous or somewhat tomentose with soft cinereous or tawny hairs. Principal leaves 9–18 cm. long, the petioles 5–20 mm. long, shorter than the lowermost leaflets; stipules ovate to linear-lanceolate, 9–15 mm. long, 3–5 mm. broad, glabrous on the inner surface, usually deciduous; leaflets of the principal leaves 7–11, narrowly elliptic, oblong or occasionally lance-oblong, the base usually rounded, the apex obtuse, mucronate, the outermost leaflets usually largest, (30–)40–73 mm. long, (11–)15–22(–24) mm. wide, 2.5–4 times as long as wide, the basal leaflets smallest, often elliptic, (17–)27–40 mm. long, (10–)15–19 mm. wide, 1.5–2(–2.5) times as long as broad; leaflets firm or somewhat coriaceous, slightly lustrous, velvety to touch, hirtellous to hirsutulous with tawny hairs above, moderately to densely hirsusulous or somewhat tomentose with cinereous or (along the veins) tawny hairs below, the veins inconspicuous, the areoles between the lateral veins nearly isodiametric; petiolules 2–3 mm. long, hirsutulous with tawny or rusty hairs. Inflorescences terminal and solitary in the upper axils, usually leafless or 1 node with a leaf, lax, erect or ascending, the terminal inflorescence 25–30 cm. long, the axillary inflorescences 7–25 cm. long, exceeding the leaves, the peduncles 5–13 cm. long, the flowering nodes 3–11; buds 3–5 at a node, 3 or 4 flowering. Primary bracts lanceolate to lance-ovate, acuminate, 16–17 mm. long, 4 mm. wide, 7-veined, deciduous; secondary bracts lanceolate, acuminate, 12–16 mm. long, deciduous. Pedicels 10–20 mm. long. Dried flowers 27–35 mm. long. Calyx, pedicels, bracts and bracteoles very densely villous with fine soft cinereous or (on the lobes and bracts) tawny or rusty hairs. Calyx campanulate, 14–16 mm. long, the upper lobes 3–8 mm. long, the lateral lobes lanceolate, acuminate, 10–12 mm. long, the lowermost lobe lanceolate or lance-ovate, acuminate, 11–13 mm. long, ca. 4 mm. wide at the base. Calyx or pedicel with 1 or 2 linear-lanceolate deciduous bracteoles 5–10 mm. long. Corolla rose-purple, violet when dry, the banner with a conspicuous green spot at the base of the blade within; blade of the banner subquadrate or suborbicular, 24–27 mm. high and wide, densely hirsutulous with soft ascending cinereous hairs on the back, the claw 8–10 mm. long; wings 31–34 mm. long, 10–11 mm. wide, exauriculate, the claw 6–7 mm. long; keel 32–34 mm. long, 12–14 mm. deep, exauriculate, the claw 8 mm. long. Staminal tube 25–27 mm. long, the vexillary stamen coherent with the tube, free at the base, with a prominent callosity on the upper side ca. 5 mm. from the base. Ovary densely hirsute to villous with ascending hairs, the style barbate; ovules 11–13. Legumes linear, curving slightly upward, 7–9 cm. long, 6–7 mm.

wide, very densely villous with lustrous tan or (along the sutures) tawny or rusty hairs; seeds 9–10(–13?), the mature seeds not seen. PLATE 1155.

DISTRIBUTION. Known only from the type-locality. Map 22.

SPECIMENS EXAMINED. MEXICO. GUERRERO: "Small tree or shrub," Casahuates, Taxco, *Ruth Q. Abbott 189*, 23 Dec. 1936 (fruit) (GH); herb or slender little-branched shrub, 1–6 ft. high (sterile), on sunny oak-wooded slopes between Casahuates and small reservoir at head of waterfall above town on mountain west of Taxco, 6200–6500 ft. (1900–2000 m.), *H. E. Moore, Jr. & C. E. Wood, Jr. 4586*, 17 Aug. 1948 (GH, UC, Bailey Hortorium); preceding locality, *Ruth Q. Abbott*, 20 Oct. 1948 (flower & young fruit) (GH-Type; UC, Bailey Hortorium).

This distinctive new species was collected in fruit in 1936 by Mrs. Gordon C. Abbott of Taxco in the mountains above Taxco near the village of Casahuates and sent by her to the Gray Herbarium in 1937 along with numerous other interesting plants from this region, including the first material of *Tephrosia quercetorum*. Although the large, furry calyces and legumes and the few, relatively large leaflets marked it as a new species (so annotated by Dr. I. M. Johnston in 1937), I hesitated in early 1948 to base a description on the single fruiting specimen. Accordingly, Dr. H. E. Moore, Jr. and I, in the course of field-work in Mexico, visited Taxco in August 1948, hoping to collect additional material of both *T. quercetorum* and this species. Mr. and Mrs. Abbott extended to us their kind hospitality, enthusiastically gave us detailed directions for locating the plants, and, when we failed to find flowering material at Casahuates, promised to do their best to obtain specimens later in the year. Their best has been highly satisfactory, for after various frustrations they have succeeded in securing flowering specimens which show this new species to be even more remarkable than appeared from the fruit. The rose-purple flowers are the largest of any American species of the genus and these with the large, densely villous calyces and pods, the deciduous bracteoles, large bracts, and few, large leaflets make this (to my mind, at least) the handsomest and one of the most distinct species in the Americas. It seems highly appropriate that this plant should be associated with the name of its discoverer, RUTH Q. ABBOTT.

The relationships of *Tephrosia Abbottiae* seem to be with *T. platyphylla*, *T. diversifolia*, *T. major*, and *T. pachypoda*, all of which are local species of the western Sierra Madre of Mexico.

It is so distinctive, however, that it is not likely to be confused with any of these plants.

42. **Tephrosia pachypoda** Riley

Tephrosia pachypoda Riley, Kew Bull. **1923:** 230. 1923. "Sierra Madre" (between Mazatlán and Durango or Durango and Tepic, probably in Sinaloa or Nayarit), Mexico, *Seemann 2183*, Nov. 1849–Feb. 1850 (K-Type; GH; NY-photograph of GH).

Cracca pachypoda (Riley) G. Ortega, Apuntes Fl. Indig. Sinaloa (Cat. Sist. Pl. Sinaloa) 15. 1929.

Cracca velutina Rydb. N. Amer. Fl. **24:** 171. 1923, not (Spreng.) Kuntze, 1891. Zopilote [Zopelote on label], Nayarit, Mexico, *F. H. Lamb 575* (in part), Feb. 1895 (NY-Type; MO, DS, US–275488). Material of this collection-number in GH and US (201628) is *T. crassifolia* Benth.

Tephrosia lanata Mart. & Gal. var. *velutina* (Rydb.) Macbr. Field Mus. Publ. Bot. **4:** 87. 1925, as to name but probably not as to plant. See Morton, Contr. U. S. Nat. Herb. **29:** 101. 1945.

Cracca lupinoides M. E. Jones, Contr. West. Bot. **15:** 137. 1939. Among the live-oaks, El Tigre Mine, Acaponeta, Nayarit, Mexico, *M. E. Jones 23016*, 1 Mar. 1927 (POM-Type; GH, NY, UC).

Tephrosia lupinoides (M. E. Jones) Morton, Contr. U. S. Nat. Herb. **29:** 101. 1945.

Erect shrubby perennial 1–2 m. high. Stems, petioles, rachises, petiolules, axes of inflorescences, pedicels and calyces densely tomentose with short somewhat tortuous and often tangled cinereous to rusty hairs, soft, woolly. Principal leaves 11–27 cm. long, the petioles 5–25 mm. long, much shorter than the lowermost leaflets of a leaf, the rachises 5–15 cm. long; stipules narrowly triangular, 9–12 mm. long, 4–5 mm. wide, or the uppermost sometimes ovate, the apex rounded, 5 mm. long, 3 mm. wide, deciduous, brown, densely tomentose without; leaflets of the principal leaves 7–11, the terminal and uppermost pairs largest (4.5–)7–12 cm. long, (1.5–)2–6 cm. wide, elliptic, oblong-elliptic, oblong, elliptic or oval, apex of leaflets obtuse, rounded or slightly retuse, acutish, mucronate, the base obtuse, rounded or subcordate; leaflets thick, coriaceous, very veiny above, the veins often reddish, the margins often wavy and rolled under, the upper surface evenly hirtellous with very fine soft somewhat twisted tawny hairs, glabrate, lustrous, the lower surfaces hirtellous to hirsutulous, tomentose with tawny or rusty twisted hairs, especially along the veins, soft to touch, the veins raised, conspicuous, very numerous between the principal lateral veins; petiolules 3.5–7 mm. long, stout, often 2 mm. thick. Inflorescences terminal and solitary in the upper axils, often wand-like, erect or ascending, usually much exceeding the leaves, leafless, 11–60 cm. long, the peduncle (2–)4.5–14 cm. long, often stout, 1.5–4.5 mm. thick, angled, buttressed below the 15–45 flowering nodes; buds ca. 7–9 at a node, ca. 5–7 flowering, 1–4 fruiting. Primary bracts narrowly deltoid to linear-lanceolate, acuminate, 4–8 mm. long, 1–2 mm. wide, deciduous; secondary bracts 2.5–5 mm. long, less than 1 mm. wide, deciduous. Pedicels 5–9

mm. long, ca. 1 mm. thick, ascending. Dried flowers 15–19 mm. long. Calyx campanulate, 5–7 mm. long, the tube 3–4 mm. long, the lobes abruptly short-acuminate, the upper triangular, 2–3 mm. long, the lateral ovate to ovate-lanceolate, 4–5 mm. long, the lowermost ovate-lanceolate to lanceolate, 4–6.5 mm. long. Corolla apparently purplish or rose, the banner with a green spot at the base; blade of the banner nearly orbicular, 13–15 mm. high, 12–17 mm. broad, densely short-hairy without, the claw ca. 3.5 mm. long; wings 13–17 mm. long, 4–7 mm. wide, slightly auricled, the claw 3 mm. long; keel 12–17 mm. long, ca. 6–7.5 mm. deep, slightly auricled, the claw 3.5 mm. long. Staminal tube (12–)13–15 mm. long, the vexillary stamen coherent with the tube, free at the base and apex, with a conspicuous 2-lobed callosity on the upper side near the base. Ovary densely hirsutulous. Legumes linear, straight or slightly curved downward, 4–6.5 cm. long, 5.5–6 mm. broad, strongly ascending or spreading, densely tomentose with rather tortuous and intertwined tawny or rusty hairs (ca. 1.5 mm. long); seeds (4–)9–11, oblong-oval in outline, plump, 3.8–4.2 mm. long, 2.8–3 mm. broad, reddish brown variegated with black. Flowering collections between November and March.

DISTRIBUTION. Probably in oak woods, mountains of Nayarit and possibly southern Sinaloa, Mexico. Map 22.

SPECIMENS EXAMINED. SINALOA, DURANGO or NAYARIT: Sierra Madre, [between the cities of Mazatlán and Durango or Durango and Tepic], *Seemann 2183* (GH, K; NY-photograph of GH). NAYARIT: Zopilote, 2000–3000 ft., *Lamb 575* (part) (A, DS, MO, NY, US); among the live-oaks, Tiger Mine, Acaponeta, *M. E. Jones 23016* (GH, NY, POM, UC).

Tephrosia pachypoda has the dubious distinction of being known at present from three collections, each of which is a type-series! All three clearly represent the same species which is well marked by the large, coriaceous leaves with 7–11 leaflets and by the long, terminal and axillary inflorescences, the calyx, and the slender, densely tomentose legumes.

43. **Tephrosia major** Micheli

Tephrosia major Micheli, Mem. Soc. Phys. et Hist. Nat. Genève **34:** 251. pl. 4. 1903. El Ocote, 700 m., [apparently in southeastern Dist. Montes de Oca between Petatlán, La Morena and Chuveta], Guerrero, Mexico, *E. Langlassé 716*, 15 Dec. 1898 (GH, US).

Cracca major (Micheli) Rose, Contr. U. S. Nat. Herb. **12:** 270. 1909, not Alef. 1861.

Cracca Micheliana Standl. Contr. U. S. Nat. Herb. **23:** 472. 1922. Substitute for *C. major* (Micheli) Standl.

Erect shrubby perennial 1–1.5 m. high; stems rigid, sulcate, angled. Stems, petioles, rachises and axes of inflorescences densely hirtellous-tomentose with grayish, tawny or blackish (soiled), crowded, straight or twisted hairs. Leaves spreading or ascending, 13–20 cm. long, the petiole

5–13 mm. long, the rachis 3–5.5 cm. long; stipules minute, triangular, ca. 1.5 mm. long, tightly appressed and densely tomentose; leaflets of the principal leaves 3–5 (the uppermost sometimes reduced to 1), elliptic, oblong-elliptic, obovate-oblong, or oval, the base of the terminal leaflet at least acute or cuneate, the others cuneate, acute or rounded, usually obliquely so, the apex obtuse, rounded or retuse, with a small mucro; lowermost leaflets smallest, 4–12 cm. long, 2.2–4.5 cm. broad; leaflets coriaceous, thinly covered above with twisted hairs 0.4–1 mm. long, glabrate and shining except along the principal veins, the veins conspicuous, the principal laterals departing from the midrib almost at right angles, curving upward, the lower surface densely tomentose with short tortuous hairs; petiolules 2–6 mm. long, sometimes 2 mm. thick. Inflorescences terminal or solitary in the upper axils, the terminal 7–45 cm. long, often with 1–3 branches 4–23 cm. long from the axils of deciduous bracts, leafless, erect or ascending, usually exceeding the leaves, angled, sulcate, strongly buttressed below the 5–25 distant flowering nodes, the peduncle 3–13 cm. long; buds ca. 5 at a node, 3 of these flowering, 1 or 2 fruiting. Primary and secondary bracts small, linear-lanceolate, 2–5 mm. long, densely tomentose without, glabrous within, deciduous. Pedicels 5–8 mm. long, ascending, densely tomentose with short, twisting hairs. Dried flowers 18–21 mm. long. Calyx 6 mm. long, densely tomentose with short, rather tortuous cinereous to rusty hairs, the tube 4–4.5 mm. long, the upper lobes acuminate, 1–2 mm. long, the lateral triangular, acuminate, to triangular-lanceolate, acuminate, 2.5–4 mm. long, the lowermost triangular-acuminate to lanceolate, 2.5–6.5 mm. long. Corolla "white tinged with violet" (Langlassé) or rose (Hinton), probably white and becoming rose or violet in age, the banner with a green spot at the base; blade of the banner suborbicular, 15–17 mm. high, 17–19 mm. broad, densely tomentose without, the claw 4–5 mm. long; wings 18–20 mm. long, 6–7.5 mm. wide, auriculate, the slender claw 4–4.5 mm. long; keel 17–18 mm. long, with a short, obtuse beak, the claw 4.5 mm. long. Staminal tube 13–14 mm. long, the vexillary stamen coherent with the staminal tube, free at the base, with a 2-lobed thickening on the upper side. Ovary densely hirsutulous. Legumes stout, nearly straight or slightly curved downward, 4–4.5 cm. long, 6–7 mm. wide, beaked, spreading, densely hirsutulous with nearly straight crowded erect somewhat lustrous cinereous to tan hairs, pilose; seeds (6–)8–9, ca. 4 mm. long, 3 mm. wide, brown variegated with black. Flowering collections in December.

Distribution. Oak forests, 600–700 m., in western Guerrero, Mexico. Map 22.

Specimens examined. MEXICO. Guerrero: Granitic soil, El Ocote, 700 m., [probably in southeastern Montes de Oca between Petatlán, La Morena and Chuveta], *Langlassé 716*, 15 Dec. 1898 (GH, US); oak forest, Sierrita–Palo Solo, Dist. Galeana, 600 m., *Hinton 14998*, 13 Dec. 1939 (GH, NY, PH, TEX, US).

The type-locality of this interesting and very distinct species